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ABSTRACT

The ERIC Clearinghouse on Information Resources at Stanford University presents a compilation of bibliographies, articles, and information about the Educational Resources Information Center in a bicentennial salute to United States libraries. Bibliographies include a list of subject guides to information in a variety of formats, a bicentennial collection on the American revolution compiled by the Illinois Library Association, and a bibliography of bibliographies of American Indian materials for adults. The conclusion from the final draft of the National Commission on Libraries and Information Science's "A National Program for Library and Information Services" is reprinted, as are an article on the Ohio College Library Center (from "Library Resources and Technical Services") and one on Stanford University's BALLOTS system (from "Journal of Library Automation"). Information about ERIC includes a list of the clearinghouses, a directory of ERIC microfiche collections, and ordering information. (LS)

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LOOKING FORWARD TO 1976 :

A Selected Bibliography on the Functions and Contributions of Libraries in American Society

A Microfiched Bibliography Prepared for the 1975 American Library Association Convention, San Francisco, by the ERIC Clearinghouse on Information Resources and the Stanford Libraries.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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INTRODUCTION

With the American Library Association 1975 Conference theme of "Looking Forward to 1976," it seems appropriate to look at the contributions of libraries to intellectual life in America as we approach the bicentennial of the country. In illustrating this theme through citations of books and articles and some representative items, the ERIC Clearinghouse on Information Resources and the Stanford University Libraries have identified three aspects of libraries' impact on American society.

ACCESS

In order for libraries to have an impact upon society, it is necessary for individuals to gain access to library materials. American libraries have developed an impressive series of guides to their resources. A representative group of such guides is cited in the ACCESS section. Included are resource guides which are national in scope; which cover a variety of library materials such as books, manuscripts, microforms, etc.; and which can be accessed by subject.

BIBLIOGRAPHIES

Libraries are beginning to make a greater effort to reach all segments of American society. This social and cultural role of libraries is exemplified by a sampling of some representative recent bibliographies based upon library catalogs and published by library associations, libraries, or librarians. The scope of these bibliographies ranges from the current emphasis on the bicentennial to disadvantaged and minority groups such as the American Indian. Two complete bibliographies have been reprinted from other sources--a

bibliography on the American Revolution from Illinois Libraries and a bibliography on American Indian bibliographies from American Libraries. Many other bibliographies may be found through your local ERIC collection or by consulting Library Literature.

INNOVATIONS

Libraries have been attempting to cope with a monumental information explosion, and fortunately technology is beginning to bring some advances. This section includes the "Conclusion" of the Final Draft report of the National Commission on Libraries and Information Science (NCLIS) which points out the growing recognition in the library community of the need for cooperation. Also cited is a source book antecedent to the NCLIS report which explains the important role the Library of Congress plays as a national information resource and cultural center. A register of bicentennial activities is cited as an example of an on-line service from a government agency that libraries should know about and utilize. Finally, two articles on emerging automated systems, Project BALLOTS of Stanford University and the Ohio College Library Center (OCLC), indicate the direction in which the library community is moving to meet the information demands of Americans.

---Frederick C. Lynden
Deborah O. Lynden

ACCESS

Ash, Lee. Subject collections: a guide to special book collections and subject emphases as reported by university, college, public and special libraries and museums in the United States and Canada. 4th ed., revised and enlarged. New York: R.R. Bowker Company, 1974. 908p.

Downs, Robert Bingham. American library resources; a bibliographical guide. Chicago: American Library Association, 1951. 428p. Supplement 1961-70 published 1972 also available from American Library Association. 244p.

Government Documents on Microfilm 1971. Ann Arbor: University Microfilms, 1971. 507p.

> Selected United States Government documents available on microfilm from University Microfilms are listed in this annotated catalog. Many of these documents were originally published by the U.S. Government Printing Office and issued to depository libraries across the country. Others were published by private printers and may not be considered part of the depository collection. The microfilm documents are listed by type: administrative reports; statistical reports; committee or commission reports; reports of investigation and research; hearings before committees of Congress; documents, journals, and proceedings; laws; statutes, compilations, and codes; decisions and opinions; rules, regulations and manuals; bibliographies and lists; general and descriptive information; and periodicals. A complete listing of the microfilmed hearings, committee prints, and reports of the 82nd through the 86th Congresses is presented. Each listing gives an ordering number and the price of microfilm and, when available, of hardcopy.

Kaminov, Marion J. United States local histories in the Library of Congress: a bibliography. 4 vols. Baltimore, Md.: Magna Carta Book Company, 1975.

The national union catalog of manuscript collections. Hamden, Conn.: Shoe String Press, 1959/61--.

U.S. Library of Congress. National Referral Center. A directory of information resources in the United State: biological sciences. Washington, D.C.: Science and Technology Division, National Referral Center, U.S. Government Printing Office, 1972. 577p.

U.S. Library of Congress. National Referral Center. A directory of information resources in the United States: federal government; with a supplement of government-sponsored information resources. Rev. ed. Washington, D.C.: Science and Technology Division, National Referral Center, U.S. Government Printing Office, 1974. 416p.

U.S. Library of Congress. National Referral Center. A directory of information resources in the United States: social sciences. Rev. ed. Washington, D.C.: Science and Technology Division, National Referral Center, U.S. Government Printing Office, 1973. 700p.

U.S. Library of Congress, Union Catalog Division. Newspapers on microfilm, 1st—ed. Washington, D.C.: Library of Congress, 1948—.

U.S. National Historical Publications Commission. Guide to archives and manuscripts in the United States. Philip M. Hamer, ed. New Haven, Conn: Yale University Press, 1961. 775p.

White, Carl Milton. Sources of information in the social sciences, a guide to the literature. Chicago: American Library Association, 1973. 702p.

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Childers, Thomas. The information-poor in America. Metuchen, N.J.: Scarecrow Press, 1975.

THE DECLARATION OF INDEPENDENCE. A CASE STUDY IN PRESERVATION
Clapp, Verner Special Libraries; 62; 12; 503-508 Dec 71

The travels and tribulations of the Declaration of Independence are of particular interest in this period of the American Revolution Bicentennial. They are described, with emphasis on the history of its perservation.

PRESIDENTIAL LIBRARIES
Cole, Garold L. Journal of Librarianship; 4; 2; 115-129 Apr 72

Presented are a description of the history of the presidential papers in the United States, the development and functions of the presidential library system, and a brief look at future developments. (39 references)

Davies, David William. Public libraries as culture and social centers: the origin of the concept. Metuchen, N.J.: Scarecrow Press, 1974. 167p.

Fingerhut, Eugene R. The Fingerhut guide: sources in American history. Santa Barbara, Calif.: ABC Clio Press, Inc., 1974. 148p.

This work is divided into two parts: Part I contains only separately published bibliographies which are arranged by 11 major subject areas and in sub-divisions of these areas. Part II contains general references to aid in finding sources and material not included in Part I. Material included is limited to works published since 1942 and readily available in most libraries.

COLLECTING AND USING LOCAL HISTORY.
Miller, Marcia Ruth
New Mexico Research Library of the Southwest, Sante Fe.
Pub Date 71 Note-31p.
Available from-New Mexico Research Library of the Southwest, P.O. Box 4725, Santa Fe, New Mexico 87501 ($1.75)
EDRS Price MF-75c HC Not Available from EDRS.

The local history collection should contain: county histories; city and village histories; state and regional histories; anniversary booklets; company histories; local newspapers; local magazines; genealogies; family albums; diaries; journals, and letters; account books; club yearbooks; school annuals; telephone books, city directories and local maps; and public records. The local history collection should also be suitably housed, easily accessible with a comprehensive catalog and a helpful, intelligent staff. Community members who may use the collection are: staffs of the local newspapers, radio and television stations; professional and amateur genealogists; professional historians; economists; writers; clubs and other community groups; teachers; students; and artists.

RECORDS OF GENEALOGICAL VALUE TO NATIVE AMERICANS IN THE NATIONAL ARCHIVES AND THE FEDERAL ARCHIVES AND RECORDS CENTERS
Moristo, Dennis; Young, James R. American Indian Culture Center Journal; 5; 2; 26-8 F 73

SPANISH HERITAGE AND INFLUENCE IN THE WESTERN HEMISPHERE.
San Francisco Unified School District, Calif.
Spons Agency-Office of Education (DHEW), Washington, D.C.
Grant-OEG-9-72-0003(207)
Pub Date Sep 72 Note-49p.
EDRS Price MF-$.75c HC- $1.85

This is a selected bibliography of some good and some outstanding audio-visual educational materials in the library of the Educational Materials Bureau, Audio-Visual Educational Section, that may be considered of particular interest in the study of Spanish heritage and influence in the Western Hemisphere. The bibliography is arranged alphabetically within the following subject areas. The titles dealing with the Filipino culture are included in both this listing and the Asian and the Asian-American bibliography (UD 013 958): I. Spanish Influences in the Americas, History; II. Aztec, Inca, and Maya Civilizations; III. Early California, History; IV. United States Expansion and Influence; V. The Mexican-American; VI. Spanish Speaking Countries and Peoples: Spain; The Americas (General, Mexico, Central America, Caribbean Lands, South America); Philippine Islands. VII. Art, Music, Cuisine, and Related Titles. VIII. Spanish Language--Audio-Visual Materials. The number of copies held of these materials is limited and many are exceptionally popular. Booking is always on a first-come, first-served basis and within the limits of the Audio-Visual Education Section's manpower, delivery facilities, plant, and available funds.

Schiller, Justin G. "Magazines for young America; the 1st 100 years of juvenile periodicals [bibliographical essay]," Columbia Library columns 23; 24-39 (May 1974).

Smith, Jessie Carney. "Librarianship and black studies; a natural relationship," in Library and information services for special groups. New York: Science Associates/ International, 1974. p. 202-60.

THE PUERTO RICANS: AN ANNOTATED BIBLIOGRAPHY.
Vivo, Paquita, Ed.
Pub Date 73 Note-299p.
Available from-R. R. Bowker Co., 1180 Avenue of the Americas, New York, N.Y. 10036 ($14.95)

The initial selection of titles for this bibliography was based on a survey of library catalogs as well as numerous existing lists and partial bibliographies on Puerto Rico. Careful search led to a bibliography that, although selected, is also retrospective, broad, and balanced. It is retrospective in the sense that the first known published works about Puerto Rico or by Puerto Rican authors were surveyed and included. It is also a broad bibliography, for it includes a diversity of aspects--history, culture, education, music, science, social conditions, and many others. In terms of time, it covers from the pre-Columbian era to contemporary political thought and economic development. It includes, too, the entire spectrum of thinking on Puerto Rican affairs, especially in the political field. Even works with a visible bias are included, for they help the reader to understand the various ideologies at work in the island. The decision regarding inclusion in the bibliography, then was chiefly governed by one condition: whether the work adds to the knowledge of Puerto Rico and the Puerto Ricans. Besides the Library of Congress catalog, the Puerto Rican Collection at the University of Puerto Rico library--which is undoubtedly the most complete collection on the subject of the bibliography--and the collections of the Ateneo Puertorriqueno, the Instituto de Cultura Puertorriquena, the Centro de Investigaciones Historicas of the University of Puerto Rico, and the New York Public Library also were consulted.

AUDIOVISUAL RECORDS IN THE NATIONAL ARCHIVES RELATING TO BLACK HISTORY. PRELIMINARY DRAFT.
Waffen, Leslie; And Others
National Archives and Records Service (GSA), Washington, D.C.
Pub Date Jul 72 Note-16p.; Paper prepared for Annual Meeting of the Association for the Study of Negro Life and History (56th, October 1971)
EDRS Price MF- 75c HC-$1.50

A representative selection of the National Archives and Records Services' audiovisual collection relating to black history is presented. The intention is not to provide an exhaustive survey, but rather to indicate the breadth and scope of materials available for study and to suggest areas for concentrated research. The materials include sound recordings, motion pictures, and still pictures, covering various areas of black history dating as far back as the Civil War. Annotations are provided for each collection and records are classified by the following Government organizations: Presidential Agencies, the State Department, Defense Department, Agriculture Department, Department of Health, Education, and Welfare, Department of the Interior, Department of Transportation, Department of Labor, the Supreme Court, the National Archives Collection of Foreign Records Seized, the National Archives Gift Collection, and independent executive agencies. An appendix lists materials found in the Harmon Foundation Collection.

american revolution – bibliography prepared by ila bicentennial committee

Basic Paperback Collection For Public Libraries

(Under $100.—)

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Gipson, Lawrence H. *The Coming of the Revolution, 1763-1777.* Harper Torchbooks (TB3007). $3.25.

Jensen, Merrill. *The Articles of Confederation: an Interpretation of the Social Constitutional History of the American Revolution 1774-1781.* U. of Wis. Press (W12). $3.75.

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Mitchell, Joseph B. *Decisive Battles of the American Revolution.* Fawcett World (P664, Prem). $1.25.

Morgan, Edmund S. *The Stamp Act Crisis: Prologue to Revolution.* Rev. ed. Macmillan (Collier Books). $1.50.

Peckham, Howard H. *The War for Independence: a Military History.* Univ. of Chicago Press (CHAC 15). $2.95.

Quarles, Benjamin. *The Negro in the American Revolution.* New York: Norton, 1973. $1.95.

Robson, Eric. *American Revolution in its Political and Military Aspects.* New York: Norton, 1966. $1.95.

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VanDoren, Carl C. *The Secret History of the American Revolution.* New York: Viking, 1968. $2.95.

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American Revolution — General Works

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Calhoon, Robert M. *The Loyalists in Revolutionary America, 1760-1781.* (The Founding of the American Republic Series) New York: Harcourt Brace, 1973. $17.50.

Davidson, Philip G. *Propaganda and the American Revolution.* Chapel Hill, North Carolina: University of North Carolina Press, 1941. $7.50.

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Higginbotham, Donald. *The War of American Independence: Military Attitudes, Policies, and Practices.* New York: MacMillan, 1971. $12.95.

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Maier, Pauline. *From Resistance to Revolution: Colonial Radicals and the Development of American Opposition to Britain 1765-1776.* New York: Knopf, 1972. $10.00.

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Reprinted from the March 1975 (Vol.57,no.3) issue of Illinois Libraries (Archives Issue) with the kind permission of Mrs. Irma Bostian, Editor.

American Revolution — Military and Naval Aspects

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Cooper, James F. *The Spy.* New York: Popular Library, 1971. (Paperback) $.95.

Kennedy, John P. *Horse-Shoe Robinson.* New York: Hafner, 1962. (Paperback) $3.95.

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Moore, Ruth N. *Hiding the Bell.* Westminster, 1968.
Morris, Richard B. *The First Book of the Constitution.* Watts, 1958.
National Geographic. *America's Historylands.* National Geographic, 1967.
Palmer, Joan E. *The Red Petticoat.* Lothrop, 1969.
Pearson, Michael. *Those Yankee Rebels.* Putnam, 1974.
Peterson, Harold L. *Book of the Continental Soldier.* Stackpole, 1968.
Phelan, Mary K. *Four Days in Philadelphia.* Crowell, 1967.
_____. *Midnight Alarm.* Crowell, 1968.
_____. *Story of the Boston Tea Party.* Crowell, 1973.
Ross, George E. *Know Your Declaration of Independence and the 56 Signers.* Rand, 1963.
Russell, Francis. *Lexington, Concord and Bunker Hill.* Harper, 1963.
St. George, Judith. *Turncoat Winter, Rebel Spring.* Chilton, 1970.
Sanderlin, George. *1776: Journals of American Independence.* Harper, 1968.
Savery, Constance. *Reb and the Redcoats.* McKay, 1961.
Schackburg, Richard. *Yandee Doodle.* Prentice-Hall, 1965.
Sloane, Eric. *Museum of Early American Tools.* Funk, 1964.
Sobol, Donald J. *Lock, Stock & Barrel.* Westminster, 1965.
Speare, Elizabeth G. *Life in Colonial America.* Random, 1963.
Spier, Peter. *The Star-Spangled Banner.* Doubleday, 1973.
Starkey, Marion. *Lace Cuffs and Leather Aprons.* Knopf, 1972.
Steele, William O. *Year of the Bloody Sevens.* Harcourt, 1963.
Stubenrauch, Bob. *Where Freedom Grew.* Dodd, 1970.
Syme, Ronald. *Benedict Arnold, Traitor of the Revolution.* Morrow, 1970.
Taylor, Theodore. *Rebellion Town: Williamsburg, 1766.* Crowell, 1973.
Tunis, Edwin. *Colonial Craftsmen. World, 1963.*
_____. *Colonial Living.* World, 1957.
_____. *Shaw's Fortune.* Collins-World, 1966.
_____. *The Tavern at the Ferry.* Crowell, 1973.
_____. *The Young United States.* World, 1969.
Voight, Virginia F. *Patriot's Gold.* Macrae, 1969.
Wagner, Frederick. *Submarine Fighter of the American Revolution.* Dodd, 1963.
Watson, Sally. *The Hornet's Nest.* Holt, 1968.
Wibberley, Leonard. *John Treegate's Musket (and sequels).* Farrar, 1959.
Wilbur, C. Keith. *Picture Book of the Revolution's Privateers.* Stackpole, 1973.

Wise, William. *The Spy and General Washington.* Dutton, 1965.

Non-Print Selections on the History and Meaning of the American Revolution
Prepared by ILA A V Committee

Film — 16mm

America: A Picture In My Mind
The speeches of Martin Luther King and John F. Kennedy illuminate America's history.
Paulist Productions, 10 min., $140 (Available Andy Olenyik Films, 10927 Carroll Wood Way, St. Louis, Missouri 63128)

America: I Know You
A poetic appreciation of the country, its ways and people.
Film Fair Inc., 6 min., $85 (22 W. Hubbard, Chicago, Ill. 60610)

Freedom River
Animated parable about the ways people handle freedom.
BFA Educ. Media, 7 min., $130 (2211 Michigan Ave., Santa Monica, Calif. 90404)

The National Anthem
A symphonic arrangement of the music set against a montage of history.
Dunn-Donnelly Publishing, 3 min., $67 (Box 860, Radio City Station, New York, N.Y. 10019)

Filmstrips:

The American Revolution in Art
1 strip, 70 fr., 20 min., Gr. 7-12
Miller Brody #A211, w/disc: $20; w/cassette: $22

Americans Who Shaped History
Paul Revere, Patriot and Craftsman
Betsy Ross: Flagmaker for America
The Washingtons, America's First Family
The Jeffersons of Monticello
Troll Associates (Distr. Franklin Watts), $7.00 ea., Gr. 3-6

Founding of the Nation: The American Revolution
The Boston Tea Party
The Shot Heard Round the World
Valley Forge
Yorktown
Encyclopaedia Britannica Sound Filmstrip Series, w/discs: #6469
Each unit $13.00
Series, boxed $46.80
w/cassettes: #6469K
Each unit $14.95
Series, boxed $53.82.

George Washington: What Was He Really Like?
1 strip, 40 fr., 7½ min., Gr. 4-6
Multi-Media Prods. #6-01002 w/disc: $9.95; w/cassette: $11.95

Preface to the American Revolution
1 strip, 45 fr., 8½ min., Gr. 4-6
Multi-Media Prods., #6-01001 w/disc: $9.95; w/cassette: $11.95

Who Was Right?
1 strip, 65 fr., 30 min., Gr. 7-Adult
Current Affairs Films #436 w/disc: $45; w/cassette: $30

Yankee Doodle
Performed by Tom Glazer with illus. from Ed Emberley's book.
1 strip, 48 fr., 5 min.
Westport Communications Group #CCC23 w/disc: $11.50

Recordings

America the Beautiful
Patriotic songs sung by the Robert Shaw Chorale
RCA LSC-2662 $4.95

American History in Ballad and Song
Sung by Pete Seeger, Woody Guthrie, et al
Scholastic 5801 $6.98

Ballads of the American Revolution
Sung by Wallace House, with guitar
Folkways FA 2151 #6.98

Great American Speeches, Vol. 1, 1775-1996
Read by Melvyn Douglas, Vincent Price, Ed Begley, Carl Sandburg
Caedmon TC 2016, 2 discs $14.96

Liberty, Equality, Fraternity
Man's fight for freedom from the American Revolution to the abolition of slavery.
Argo, #ZPR107/8, 2 discs $11.96

The Star Spangled Banner and Other Famous Documents and Poems
Read by Martin Donegan
CMS 532, $6.98

Pictures

American Heritage Picture Cards
Contents: Settling the New World: the Spanish, French and Dutch; Settling the New World: the English; Life in the New Nation; The New Nation Moves West
Harper & Row, 4 sets of 8 prints each (10×14 in.), $3.96 per set

American History Series (Transparency)
Hammond #8496, 24 tr. $36.00

Selective Bibliography of Bibliographies of Indian Materials for Adults

The following selective bibliography has been prepared by the ASD Adult Library Materials Committee Subcommittee on Materials for American Indians for the use of libraries and other institutions. The bibliographies have been evaluated with the help of American Indians in order to assure a sound basis from the Indian point of view.

The subcommittee began gathering bibliographies in the fall of 1970, requesting them from a great variety of sources. Nearly one hundred were received and they were evaluated during the next few months by Will and Lee Antell, members of the White Earth band of Chippewas. [*These appear as annotations in the bibliography. Ed.*] Some of the bibliographies submitted have not been listed because they were either too short or because they duplicated other listings.

The subcommittee has added some bibliographies received too late for evaluation by the Antells, but which are keys to important library collections of materials by and about the American Indian. These are marked with (*).

Since the bibliographies vary from the most scholarly to the most general public interest and differ in the coverage of print and nonprint materials, the following key has been used to identify the levels of interest and the types of materials covered:

(G) General Materials
(S) Scholarly Materials
(G/S) General and Scholarly Materials
(P) Print Materials
(N/P) Nonprint Materials
(P-N/P) Print and Nonprint Materials

American Indian Culture Research Center. *An Annotated Bibliography of Culture Change for the Teton Dakota Indians.* Marvin, S.D., n.d. 15 p. Acceptable.

Needs more research. Some titles unknown by evaluators. Suggest South Dakota people look very closely at this bibliography.

Arizona Library Extension Service. Department of Library and Archives. *Books About Indians by Indians.* Phoenix, n.d. 2 p. (G) (P) Superior.

Arizona State University. Center for Indian Education. *Indian Education Publications.* Tempe, Ariz., 1970. 1 p. (S) (P) Good.

Bowling Green State University Library. *The American Indian: A Selected Bibliography.* Compiled by Dawn McCaphy. Bowling Green, Ohio, 1970. 12p. (G/S) (P) Good.

California. University. Riverside. *Library Conscience of the 70s: A Reading List of Indians in America.* Riverside, Calif., 1971. 8p. (G/S) (P) Acceptable.

Could be much more complete. Very inadequate for a university of such size.

California. University. Santa Barbara. Library. *American Indians: A Selective Guide to the Resources of the USCB Library.* Compiled by Charles Townley. Santa Barbara, Calif., 1971. 44p. *(S) (P) Superior.

Selected bibliographies relating to Indian studies, reference sources, current Indian serials, and selected books.

Canada. Department of Indian Affairs and Northern Development. *Selective Bibliography of Works by Authors of Canadian-Indian and Eskimo Ancestry.* Ottawa: Department of Indian Affairs and Northern Development,. n.d. 2p. (G/S) (P) Superior.

Would like to see this done in U.S.

Canada. National Film Board. *National Film Board 16mm Films Relating to Native Culture.* Toronto, 1970. 4p. (G) (N/P) Good.

Could be more complete. *Trail Side* has been left out.

Cheda, Sherrill. *The First Americans: A Reading Guide.* (Reprint from Ontario Library Review, Dec. 1970, pp. 223–29; offprints available from the PLS, 4 New Street, Toronto). (G) (P) Good.

Combined Paperback Book Exhibit, Inc., *Red, White and Black (and Brown and Yellow): Minorities in America.* Briarcliff Manor, N.Y., 1970, p. 11 (G) (P-N/P) Unacceptable.

Very poor. Needs considerable updating and inclusion of many more titles on Indians.

Cooperative Children's Book Center. *Materials on Indians of North America: An Annotated List for Children.* Madison, Wis.: Cooperative Children's Book Center, 1970. 15p. (G) (P-N/P) Acceptable.

Could be substantially improved.

Correll, J. Lee; Edith L. Watson and David M. Brugge. *Navajo Bibliography*

Reprinted from American Libraries, February 1973 (V.4,n.2).

with Subject Index. Rev. ed. Window Rock, Ariz.: Research Section, Navajo Parks and Recreation, the Navajo Tribe, 1969. 2v. (S) (P) Superior.

Compiled by knowledgeable Indians.

Dockstader, Frederick J. *The American Indian in Graduate Studies; A Bibliography of Theses and Dissertations.* New York: Heye Foundation, 1957. (New York. Museum of the American Indian, Heye Foundation. Contributions, v.15). 399p.* (S) (P).

Lists theses and dissertations from 1890–1955 about the American Indian. Important for research purposes.

Fenton, William N. *American Indian and White Relations to 1830: Needs and Opportunities for Study; An Essay.* Chapel Hill: University of North Carolina Press, 1957. 138p. * (S) (P).

Annotated bibliography of studies of Indian-white relations.

"The First American" *Synergy,* Jan.–Feb. 1970, entire issue. (G/S) (P) Good.

What's here is good, but needs to be made more complete.

Hargrett, Lester. *A Bibliography of the Constitutions and Laws of the American Indians.* Cambridge: Harvard University Press, 1947. 124p. * (S) (P).

Annotated list arranged by tribes.

Hirschfelder, Arlene B. *American Indian Authors: A Representative Bibliography.* New York: Association on American Indian Affairs, 1970. 45p. (G/S) (P) Superior.

Should be ongoing. Noticed William Warren, Ojibway, was missing.

Indian-Eskimo Association of Canada. *An Annotated Bibliography of Books for Libraries Serving Children of Indian Ancestry.* Toronto: Indian-Eskimo Association of Canada, 1968. 13p. (G) (P) Acceptable.

Needs updating.

Indian-Eskimo Association of Canada. *Building a Good Self-Image: Annotated Bibliography of Indian Periodicals from the Northian Newsletter.* Toronto: Indian-Eskimo Association of Canada. 1971. 9p. (G) (P) Superior.

Would recommend all of these, but many are omitted.

Indian-Eskimo Association of Canada. *Indian Publications.* Toronto, n.d. 4p. (G) (P) Good.

Has only sketchy coverage of U.S. Indian papers.

Indian-Eskimo Association of Canada. *Publications List No. 10.* Toronto: Indian-Eskimo Association of Canada, 1970. 8p. (G) (P-N/P) Acceptable.

The Indian-Eskimo Association has done much good work.

Indian House. *LP Phonograph Records Mail Order Catalog.* Taos, N.M., 1970. 2p. (G/S) (N/P) Good.

Hope they expand this collection.

McMullen, John, Reverend. *A Guide to the Christian Indians of the Upper Plains.* Marvin, S.D.: Blue Cloud Abbey, 1969. 64p. (S) (P) Good.

Excellent piece of research. More adaptable for college or university.

Manitoba Department of Youth and Education. Curriculum Branch. *Resource Materials to Indian and Eskimo Cultures.* n.p., 1970. 80p. (G) (P-N/P) Superior.

Every region should develop a publication like this.

Michigan Department of Education. Bureau of Library Services. "From Exploitation to Concern . . . Michigan Indians Today." *Michigan in Books,* Winter–Spring 1969, pp. 8–12. (G) (P-N/P) Acceptable.

Very slim, especially for a State Department of Education Library.

Minneapolis Public Library. *The American Indian.* Minneapolis, 1969. 20p. (G/S) (P-N/P) Good.

Fairly representative, but needs more contemporary efforts.

Minnesota Historical Society. Chippewa and Dakota Indians. St. Paul, 1969. 126p. (S) (P) Superior.

This publication is quite complete, although not every selection displays sensitivity in dealing with the Indians.

Minnesota. University. College of Education. Library Services Institute for Minnesota Indians. *American Indians: An Annotated Bibliography of Selected Library Sources.* St. Paul: State Department of Education, Indian Education Section, 1970. 156p. (G) (P-N/P) Superior.

An extensive, annotated list of books, pamphlets, newspapers, magazines, and audiovisual materials, compiled by teachers and librarians, under the direction of Indian educators.

Murdock, George P. *Ethnographic Bibliography of North America.* 3d ed. New Haven, Conn.: Human Relations Area Files, 1960. 393p. * (S) (P).

Comprehensive bibliography arranged by tribes within geographic areas.

Naumer, Janet Noll. "American Indians: A Bibliography of Sources." *American Libraries.* October 1970, pp. 861–864. (G/S) (P-N/P) Superior.

An excellent bibliographical essay.

New Mexico. University. School of Law. *American Indian Law and Related Subjects.* Albuquerque: University of New Mexico School of Law, 1969. 19p. (S) (P) Superior.

New Mexico. University. School of Law. *Comprehensive Index of Articles Concerning American Indians Appearing in Legal Periodicals.* Albuquerque: University of New Mexico School of Law, 1968. 16p. (S) (P) Superior.

New Orleans Public Library. *Broken Peace Pipes: The American Indian and His Lost Birthright.* New Orleans, 1970. 9p. (G) (P) Good.

Limited in coverage.

New York. Museum of the American Indian. *Books about Indians.* New York, 1968. 54p. (G/S) (P) Good.

Excellent listing. Needs updating as many of the best books are not here. Seems to be a traditional list, but contains many good documents.

New York. Museum of the American Indian. *Indian Notes and Monographs.* No. 49 List of Publications. New York, 1969. 39p. (S) (P).

Would rate this publication very good for the advanced researcher. Heavy emphasis on Central and South America. Old publications indicate more and thorough research should be done on this.

Newberry Library, Chicago. *Dictionary Catalog of the Edward E. Ayer Collection of Americana and American Indians.* Boston: G. K. Hall, 1961. 8v. * (S) (P) Superior.

The Ayer collection of 90,000 items includes material on the archaeology and ethnology of all Indian tribes of the Americas. An outstanding research collection.

"North American Indians: 1491–1969." *Choice,* February 1970, pp. 1709–1719. (S) (P) Good.

Most of this lends itself to a scholarly study of the Indian.

O'Hara, Frederick J. "Selected Government Publications." *Wilson Library Bulletin,* March 1971, pp. 696–704. (G/S) (P) Acceptable.

One must be aware that most official B.I.A. publications reflect a view of a bureaucratic organization and not necessarily the viewpoints of the American Indian people.

Ontario Department of Education. *Multi Media Resource List on Eskimos and Indians.* n.p., 1969. 50p. Suppl., 1970. 16p. (G) (P-N/P) Superior.

Seems to be sensitive in dealing with Indians. Good film selection.

Princeton University. Library. *American Indian Periodicals in the Princeton University Library: A Preliminary List*. Princeton, N.J., 1970. 78p. * (G/S) (P) Good.

Periodicals produced by or for the American Indian ranging from newspapers published by tribes to scholarly journals.

Ronan Senior High School. *Operation Understanding*. Ronan, Mont., 1970. 82p. (G) (P) Unacceptable.

Was there Indian input in this project? That appears doubtful. Over-emphasis on references, little on class activities, limited. The bibliography, though, is acceptable.

San Jose City College. Library. *American Indians: A Bibliography of Books in San Jose City College Library*. Compiled by Edwin L. Tyson. San Jose, Calif., 1969. 15p. (S) (P) Good.

Some of the books on Aztecs and Mayas are well done.

South Dakota State Library Commission. *South Dakota Indian Bibliography*. Compiled by Mercedes B. Mackay and Thomas M. Moher. Pierre, S.D., 1967. 52p. (G/S) (P-N/P) Good.

Has good layout in recommending for specific ages and grades. Some titles unfamiliar to the evaluators.

South Dakota. University. American Indian Research Project. *Oyate Iyechinka Woglakapi: An Oral History Collection*. Ramon I. Harris, ed. Vermillion: University of South Dakota, 1970–1971. 3v. (S) (N/P) Superior (Vols. I, II evaluated).

A unique collection of taped recordings from the Indians themselves!

Stockton. The Public Library of Stockton. The Public Library of Stockton and San Joaquin County. *Amerindians*. Stockton, Calif., 1970. 17p. (G) (P-N/P) Acceptable.

There are better books available that should be listed.

Tacoma Public Library. *A Selected Sample of Books by and about American Indians with Special Emphasis on the Pacific Northwest*. Tacoma, Wash.: Tacoma Public Library and Tacoma Community College Library, 1970. 13p. (G/S) (P-N/P) Acceptable.

Needs more work by Indian authors and more contemporary works.

Ullom, Judith. *Folklore of the North American Indians: An Annotated Bibliography*. Washington, D.C.: Library of Congress, 1969. 126p. * (G/S) (P).

An annotated, selective list of tales and adaptations. Arranged by area with author, title, and subject indexes.

U.S. Bureau of Indian Affairs. *Answers to Your Questions About American Indians*. Washington, D.C., 1970. pp. 32–41. (G/S) (P) Acceptable.

Could have more up-to-date listings.

U.S. Bureau of Indian Affairs. *Indian Bibliography*. Washington, D.C., 1970. 42p. Addendum, 4p. (G) (P) Acceptable.

There are many good selections but also a number of unacceptable books, such as *Indians* by Tunis (p. 37), which have been blasted by the Indian Historical Society. (The addendum appears to be better than the rest).

U.S. Bureau of Indian Affairs. *Indians: Food and Cookery*. Washington, D.C., 1966. 3p. (G) (P) Acceptable.

Limited sources.

U.S. Bureau of Indian Affairs. *Indians: Languages*. Washington, D.C., 1968. 6p. (S) (P) Acceptable.

Limited selections.

U.S. Bureau of Indian Affairs. *Indians: Legends and Myths*. Washington, D.C., 1969. 5p. (G) (P) Acceptable.

Limited selection. Should have better selection.

U.S. Bureau of Indian Affairs. *Indians: Music*. Washington, D.C., 1969. 3p. (G/S) (P) Acceptable.

Incomplete.

U.S. Bureau of Indian Affairs. *Indians: Origin*. Washington, D.C., 1966. 3p. (G/S) (P) Acceptable.

Very limited scope.

U.S. Bureau of Indian Affairs. *Indians: Relationship with the Federal Government*. Washington, D.C., 1970. 4p. (S) (P) Acceptable.

This listing could be more extensive.

U.S. Bureau of Indian Affairs. *Indians: Religions and Ceremonies*. Washington, D.C., 1964. 4p. (G/S) (P) Acceptable.

Quite limited. Does not appear to contain much input *by Indians*.

U.S. Bureau of India Affairs. *Indians: Wars and Local Disturbances*. Washington, D.C., 1963. 15p. (G/S) (P) Unacceptable.

This kind of data on war will inevitably place the Indian in a negative role. It could be useful for factual data, history, dates, etc. Insensitive.

U.S. Bureau of Indian Affairs. *Publications Price List*. Washington, D.C., 1970. 15p. (G) (P-N/P) Good.

The B.I.A. is publishing more and more material with Indian participation in the preparation.

U.S. Department of the Interior. Indian Arts and Crafts Board. *Art of the Eskimo and Northwest Coast Indian*. Washington, D.C.: U.S. Department of the Interior, n.d. 2p. (S) (P) Good.

Good, but a highly narrow scope.

U.S. Department of the Interior. Indian Arts and Crafts Board. *Bibliography of Contemporary American Indian and Eskimo Arts and Crafts*. Washington, D.C.: U.S. Department of the Interior, n.d. 4p. (G/S) (P) Good.

Very select area of study.

U.S. Department of the Interior. Indian Arts and Crafts Board. *Indian and Eskimo Folktales*. Washington, D.C.: U.S. Department of the Interior, n.d. 4p. (G/S) (P) Superior.

Very good collection of this nature.

U.S. Department of the Interior. Library. *Biographical and Historical Index of American Indians and Persons Involved in Indian Affairs*. Boston: G.K. Hall, 1966. 8v. * (S) (P).

Monumental index arranged by subject. Contains many obscure references to articles and Bureau of Indian Affairs documents. Of great scholarly significance.

U.S. Library of Congress. Music Division. Recording Laboratory. *Music of the American Indian*. Fenton, Densmore, Rhodes, eds. Washington, D.C., 1965, 3p. (G/S) (N/P) Good.

Very limited in quantity for the National Library of Congress.

University Microfilms. *North American Indians; A Catalog of over One Thousand Items: Books, Reprints, Microfilm and Microfiche*. Ann Arbor, Michigan, 1971. 166p. (S) (P-N/P) Superior.

Would be excellent for more sophisticated library or media center. Many excellent articles for public schools. Some titles listed need further evaluation.

Upper Sandhills Regional Library. *Mari Sandoz American Indian Collection*. Valentine, Neb.: Upper Sandhills Regional Library, 1970. 10p. (G) (P) Acceptable.

Needs more recent efforts.

Washington State University Library. *Doing Research on Native Americans*. Pullman, 1971. 31p. (S) (P-N/P) Good.

Limited area of concern.

West, Joan, comp. *A Bibliography on American Indians North of Mexico*. Pasadena, Calif.: Pasadena College Library, 1971. 15p. (G/S) (P) Acceptable.

Could have a more impressive selection.

INNOVATIONS

Knight, Douglas M., comp. Libraries at large: tradition, innovation, and the national interest; the resource book based on the materials of the National Advisory Commission on Libraries. New York: R.R. Bowker, 1964. 664p.

Official Master Register of Bicentennial Activities. Fourth Edition. Washington, D.C.: American Revolution Bicentennial Administration, 1975. 653p.

Indexes and details of the master calendar of events of local, state, national and international significance which are taking place between March 1975 and December 1976. Available through a computerized Bicentennial Information Network, BINET.

VII. CONCLUSION

The Commission believes that the country's library and information services are not yet organized to meet the needs of the nation as a whole. Different libraries and information services are indeed performing important services for their respective clienteles but, as a group, they are developing hapazardly. The Commission believes the time has come for the nation to change direction by henceforth treating recorded information and knowledge as a national resource and making the benefits of library and information services available for all the people. Such action would prove a great intellectual catalyst for the country, and place the United States in a stronger position to cope with its own economic and social problems. If we continue traditional practices much longer, the Commission fears that, within the span of only a few years, America will be faced with information chaos that will work against the country's best interests.

Deficiencies in current resources and services demand careful planning for the systematic development of material and human resources, the continuing education of professional and paraprofessional personnel, an adequate financial base for libraries and other information-handling units, the cost-effective application of new technologies, and the development of a spirit of cooperation without which no nationwide plan for improved services can succeed.

Reprinted from the Final Draft of the National Commission on Libraries and Information Science report, A National Program for Library and Information Services, March 10, 1975, Washington, D.C.

A major transformation of the library and information structure in this country is required. The new structure must be based on a new philosophy of service and a new federal and state investment policy. Success will depend on sound planning by each and every library and information center, on dedication to a common sense of direction and purpose, on a commitment to national cooperative action, and on new federal policies which treat information as a national resource.

Such a program implies an unprecedented investment in libraries and information centers by federal, state, and local governments. Merely continuing the past practice of giving small grants to the states for individual libraries or for uncoordinated systems development will not do the job. The Commission believes that the federal government must bear a permanent responsibility for preserving and maintaining the knowledge resources of the nation and for making a specific commitment to their interdependent development.

The proposed National Program implies changes in jurisdictional arrangements, in forms of bibliographic processing, in patterns of service, and in funding practices. These changes will come about gradually, and it will take considerable time to achieve substantial results. Strong resources must, therefore, continue to be built at the local and state levels with federal assistance while

the new basis for a nationwide network is being prepared.

We on the Commission believe that the profession is prepared and is ready to advance traditional librarianship, to apply computer and communication technology, and to work together in creating the strongest possible information services for the country.

America must not forget her dream of individual freedom and of an open approach to learning and knowledge. The Commission firmly believes that recorded knowledge is a national resource and, its nationwide use a national responsibility. It urges the American people, through the federal government, state and local governments, and public and private institutions to support a nationwide program of library and information service as a high-priority national goal.

The Ohio College Library Center*

JUDITH HOPKINS**

The Ohio College Library Center is a regional library network. Its on-line shared cataloging system has been operational since 18 October 1971, and utilizes cathode ray tube terminals located in the center's fifty-three member libraries. These terminals are connected to the Sigma 5 computer in Columbus by a multiple line, multiple party synchronous transmission telephone network. Between January and June 1972 the system operated at an annual rate of 500,000 works cataloged and over 3,400,000 catalog cards produced. These cards are individualized to fit the requirements of each member and are produced in packs designated for particular catalogs.

THE OHIO COLLEGE LIBRARY CENTER (OCLC) will soon celebrate the sixth anniversary of its incorporation (6 July 1967); its off-line catalog card production system began operation in April 1970, its on-line cataloging system has been operational since 26 August 1971, and shared cataloging has been operational since 18 October 1971. Despite this amount of successful experience, little has been published to date about the activities of the center. Most of the articles have been rather general descriptions written before the on-line system became operational or technical papers on very specific aspects such as search keys.[1] This article describes what OCLC is and how it developed, with a brief mention of the center's plans for the future; however, the main portion is devoted to a detailed description, from a cataloger's point of view, of how OCLC operates today.

Organizationally, OCLC is a nonprofit corporation chartered in the state of Ohio. Originally limited to academic libraries in the state, since March 1973 membership has been open to nonprofit nonacademic librar-

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Manuscript received for review October 1972; accepted for publication January 1973.

* Based on a speech delivered 28 April 1972 at a meeting of the Ohio Valley Group of Technical Services Librarians, Cincinnati, Ohio. Some figures have been updated to reflect changes that have occurred since that date.

** Formerly bibliographic editor, Ohio Library Center.

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ies in the state. Members of other networks that have affiliated with OCLC are able to participate in the on-line shared cataloging system, but such libraries are not members of OCLC. As of 1 May 1973 OCLC has fifty-three members, ranging in size from small four-year liberal arts colleges and two-year community colleges to large research libraries such as Ohio State University, from public libraries such as that of Dayton-Montgomery County to highly specialized libraries such as those of the Medical College of Ohio at Toledo and Hebrew Union College.

In practice, as distinct from theory, OCLC employs the concept of the computer as a public utility. The center attempts to supply both computer power and bibliographic information in machine-readable form to its member libraries which then employ both the computer power and the bibliographic information in accordance with their own needs. Its purpose is to increase the availability of library resources within the state so that whatever information one library has is available to all other members.

OCLC does not conceive of its mission as merely the mechanization of library procedures of the past, but it does recognize that you have to start where you are and extrapolate toward where you would like to go, always, however, maintaining contact with the ground. In Greek mythology, Antaeus was destroyed when he lost contact with the ground; OCLC does not wish to share that fate.

Prior to 1967, the Ohio College Association had sponsored a special committee to consider the possibility of an Ohio cooperative library center. This committee considered such things as revising the Ohio union list of serials, cooperative acquisitions, and the establishment of a storage center. In 1963 the committee invited Wyman Parker, librarian of Wesleyan University in Connecticut, to make a study of the possibilities for academic library cooperation in Ohio. In his report Parker recommended the establishment of a bibliographic center to facilitate interlibrary lending among Ohio's academic libraries.

The committee accepted the Parker report, decided to implement it, and requested bids for the development of a bibliographic center. Several commercial firms submitted bids, but the members of the committee could not agree which bid to accept. They decided, therefore, to call in two more consultants knowledgeable in the field of library data processing to learn which of the bids the consultants would favor. The consultants chosen were Ralph Parker, then director of the University of Missouri library and the father of library automation in the United States, and Frederick G. Kilgour, then associate director for research and development at the Yale University library.

The consultants reviewed the bids being considered and recommended that neither be accepted. Instead, they suggested an entirely different approach, stating that at that period in time the mechanization of just one function of a library could not be justified. They believed the best approach would be to create a centralized, computer-based, machine-readable file that could be used for many functions, including the union

catalog, the desire for which was the motivating force behind the activities of the Ohio College Association Committee.

The committee approved of the consultants' recommendation, the Ohio College Association approved, and a corporation was formed and a director chosen. After considering a number of candidates the committee invited Kilgour to become director. He accepted and assumed the position in September 1967.

Off-Line Cataloging System

The first years were spent in bringing the corporation into being, staff building, research, systems design, and development. Finally, in April 1970, less than three years after OCLC was founded (a remarkably short period of time when the normal developmental stages of a computer-based operation are taken into account), the first system of OCLC became operational: an off-line catalog card production system.

Thirty-five members of OCLC participated in this off-line catalog card production system. Each member sent to OCLC specially supplied IBM cards. On each card the submitting library put the Library of Congress (LC) card number assigned to the book for which catalog cards were desired. In addition, the library provided its local call number if it was not willing to accept the call number provided by the Library of Congress. OCLC then keypunched this information and ran the request cards against the MARC II data base. If the records were in MARC, catalog cards were produced and sent to the requesting library.

The intermediate steps involved between the receipt of the request for catalog cards by means of the IBM cards and the production of catalog cards in the format required by each member library will be described later in this article.

On-Line Cataloging System

The off-line catalog card production system continued in existence for a little over one year. On 26 August 1971, OCLC went on-line. By "on-line" OCLC meant that a user had immediate contact with the computer; an individual in a member library could send in a message and receive an answer immediately. Members are thus able to modify records to suit their own needs. In the off-line system, libraries mailed in their requests, OCLC batched them, submitted them to the computer, and sent the cards produced to the requesting library one or two weeks after the request had been received. The cards produced off-line contained the data provided on the MARC records, unmodified, except for call numbers, by the requesting library. The off-line system lacked the give and take that is possible with an on-line system. It is like the difference between a letter and a telephone conversation.

The on-line system began with one library. During the next six weeks OCLC added all its members, not only the thirty-five that had been participating in the off-line system. Two months later, on 18 October 1971, OCLC started the shared cataloging subsystem which permits member li-

braries to input bibliographic records not available in the MARC II tapes. All OCLC records, whether prepared by the Library of Congress or by users of the Shared Cataloging System, are available to all users through the Shared Cataloging System.

Search Keys

Each user of the system has available in its own library one or more cathode ray tube terminals (CRT) with which it communicates with the OCLC computer. A CRT is in appearance a combination of a television screen and a typewriter. OCLC uses the Irascope LTE produced by the Spiras Corporation of Waltham, Massachusetts, and the OCLC Model 100 produced by Beehive Terminals of Salt Lake City, Utah. These CRTs are connected to the computer in Columbus by a multiple line, multiple party synchronous transmission telephone network. Since 1971 OCLC has had its own dedicated computer, a Xerox Sigma 5. In its earlier days of operation, the center used several computers owned by Ohio State University which acts as host to the center as well as being one of its members.

A terminal operator in a user library can call up OCLC records by one of four methods: an LC card number search, a title search, an author-title search, or an OCLC control number search. All OCLC records have title and author-title search keys, and OCLC control numbers, which are automatically assigned by the computer when a record is added to the data base. Not all records, however, have LC card numbers.

Assuming that a library has a book with an LC card number that it wishes to catalog, a terminal operator types in the LC card number on the typewriter portion of the terminal. The characters typed are displayed on the TV screen portion of the terminal. At the same time the typed message is transmitted over the telephone lines to Columbus where the computer searches the data base and flashes the answer on the screen in a period of time that can extend from the blink of an eye to three or four seconds. If the record is in the data base and the right search key has been submitted, the full catalog record is flashed on the screen. The record is not sent in catalog card format but rather is vertically formatted: main entry, title statement, edition, imprint, collation, notes, subject tracings, added entry tracings, and series tracings, as well as call numbers. In addition, the terminal display contains a fixed field area where certain coded information is displayed.

When the record is displayed on the screen, the terminal operator compares it with the book being cataloged. If the book and the record agree, fine. If not, the terminal operator makes changes in the record to bring it into conformity with the book in hand, by overtyping erroneous characters, inserting new characters in the midst of existing lines, deleting unneeded characters, or adding or deleting whole fields. If the cataloging library does not accept LC call numbers, it inserts its own. It makes whatever changes it wants in the record until it has on the screen the information that it wants to appear on its catalog cards. Also, the

terminal operator provides holdings information, showing what volumes and copies the library has and in which holding library each is to be located. When the information is arranged to the cataloging library's satisfaction, the terminal operator then depresses the PRODUCE and SEND keys. All the information, as the cataloging library may have modified it, is recorded instantaneously on a magnetic tape in Columbus. The terminal operator is then free to proceed to the next record. The previous book has been cataloged, and all that remains to be done is to prepare it physically for circulation. The catalog cards will arrive within five to seven days.

Meanwhile, all the other libraries in the system are doing the same thing. At the end of the day, the magnetic tape containing the records used that day, including the local modifications, is dismounted and run against the catalog card format program containing the special requirements of each member library and against the print program.

What happens if the LC card number is not known to the cataloging library? After all, the MARC II tapes contain all English language monographs cataloged by the Library of Congress in 1968 and the succeeding years, not just those published in the United States, and therefore records are in the data base for books that do not contain preassigned LC card numbers. If the LC card number is unknown, the cataloging library will attempt to find a suitable bibliographic record by the other keys. The author-title search key consists of the first three characters of the first word of the main entry, a comma, and the first three characters of the first word of the title, excluding initial English language articles. Thus, for a search of Puzo's, *The Godfather*, the search key would be PUZ, GOD.

The title search key consists of the first three characters of the first word of the title, again excluding initial English language articles, followed by a comma, the first character of the second word, a comma, the first character of the third word, a comma, and the first character of the fourth word. If the title contains fewer than four words it is still necessary to have the three commas. Thus, a one-word title such as *The Godfather* would be searched under the first three characters of that word followed by three commas, i.e., GOD , , , . (It makes no difference if the characters are in upper or lower case.) If more than one record in the data base matches the sort key, a list of truncated entries from which the terminal operator can choose is displayed.

The fourth search key is based on the unique sequential control number that the computer automatically assigns to each record as it is added to the OCLC data base. The OCLC control number search key consists of the number sign (#), which is a "3" shifted, and then the one to six numeric digits of which the control number is composed.

Thus, each type of search key has its own identifying characteristic that tells the computer which kind of index search is being made and therefore which index file should be examined. When the computer sees from zero to three characters followed by a comma and one to three

more characters, it searches the author-title index. When it finds three commas, it searches the title index. A hyphen is the sign to search the LC card number index while the number sign indicates that the OCLC control number index file is to be searched.

If an LC card number search as well as the title search and all possible variations of the author-title search are unsuccessful (although approximately 70 percent of the items cataloged through the system make use of existing bibliographic data) a library may decide to catalog the book itself. If so, the operator calls for a work form by typing in the letters WF and depressing the DISPLAY RECORD and SEND keys. A workform, a bare outline of a MARC II record, is then displayed on the screen. It contains field numbers, parts of MARC II tags, provision for placement of indicators, and the most commonly used subfield codes. The terminal operator completes the tagging and coding and fills in the data.

Use of the OCLC system therefore requires that the cataloging staff of the user libraries be familiar with the MARC II communications format. At first sight, the communications format is rather intimidating but this illusion is dispelled quickly. After a person has cataloged about a dozen books, he knows the basic MARC II tags and does not have to look them up again because the same ones are used over and over again. The person who does the MARC coding has to look up only the unusual codes, those that are used infrequently.

So the cataloger, or an editor who works with the cataloger's work sheets, assigns the tags and the indicators and the subfield codes to each field. A field is an element of information. The concepts are the same that librarians are used to in traditional cataloging but the terminology is different. The main entry is a field, the title statement is a field, the edition statement is a field, the imprint is a field, the collation is a field, each series note is a field, each contents note or general note is a field, each subject heading or added entry is a field, and each class number or call number is a field. Subfields are parts of fields. For example, the dates of birth and death form the date subfield of a personal name main or added entry. A subdivision of a subject heading is a subfield. Again, they are just traditional library concepts expressed in different terms.

Once the terminal operator has filled in the workform and depressed the PRODUCE and SEND keys, the input cataloging transaction is complete as far as the cataloging library is concerned. The record has been recorded on magnetic tape, and catalog cards will be produced for it just as they are for records that had already been in the data base. This time, however, there is a bonus. Whenever a terminal operator depresses PRODUCE and SEND (or UPDATE and SEND if cards are not wanted) for a record that has been input on a workform, that record is added to the OCLC data base, an OCLC control number is assigned to it, and the record is indexed. If, one second later, another library decides to catalog that book and tries one of the search keys, that library will get the rec-

ord that has just been input and will be able to use it in its own cataloging.

OCLC has found that a great variety exists in the cataloging practices followed by its member libraries. To bring about a certain amount of, if not uniformity, conformity to minimum standards, the OCLC Advisory Committee on Cataloging met monthly in Columbus from December 1971 through May 1972 to hammer out, field by field, subfield by subfield, what all members could agree should be the minimum content of a record input by a member.

The MARC II communications format provides a very full bibliographic description, fuller than most libraries are accustomed to providing on their catalog cards. To reach agreement about which fields are absolutely necessary to all libraries and should be mandatory, which should be recommended, and which should be optional, was rather difficult. However, after months of detailed discussion, a set of *Standards for Input Cataloging* was produced and adopted unanimously by the representatives.[2] Each member institution has one representative, usually the librarian but possibly the president or some member of the faculty.

Profiles

How does a library get the catalog cards that fit into its particular catalogs? When a library joins OCLC, a biliographic editor on the center's staff prepares a profile of the library. The center is interested in three categories of information. First, what collections are in the library? Second, what are the catalogs maintained by the library, including the relationship between the collections (holding libraries) and the catalogs, i.e., when a book is located in a particular holding library, what catalogs contain cards for that book?

The third type of information that the center needs to obtain relates to the elements which the library wishes on its catalog cards and how it desires the catalog cards to be formatted. What are the indentions? Are the subject headings to be in upper case or in a combination of upper and lower case? Are subject headings printed on the top of the card, or does the library use dropped headings? Does the library have any divided catalogs? If so, how are they divided? What kinds of location stamps are used; where are they printed in relation to the call number; on what cards do location stamps appear? For example, if a book is in the art library, some institutions provide that designation on all the catalog cards in all their catalogs while others provide it only on the cards filed in the main library union catalog, while the cards in the art library catalog have no location designation. Does the library use oversize indicators for certain books? If so, what kinds of oversize indicators are used? Where do they print on the catalog card in relation to the call number and the location designations? To what size books do they apply? To what books do they apply? To everything in the library? To everything in the stack collection only? To everything except the reference collection? To everything

except books in the art library which has a different oversize range since a majority of the art books are large?

As one can see from this brief list of examples, all sorts of patterns and complications are possible. All of these factors (and more) are taken into account in providing a description of an individual library's needs. After many letters, telephone calls, and even visits to a member library to clarify particular points, the bibliographic editor codes the information obtained on worksheets. The worksheets are key-punched and given to the programmers who insert the requirements of an individual library into the basic programs. The programmers set up descriptions, in machine-readable form, of each catalog pack in each holding library in what OCLC calls pack-definition tables (PDTs).

One side benefit of this process of clarification is the help it gives a library to see what it actually does as distinct from what it thinks it does. All too often, librarians have not thought through, in great detail, what they actually do. They take for granted that they know, and it is not until they have to define, field by field, subfield by subfield, character by character, what information they place on a catalog card and where exactly they place it that they really begin to know. At least one library, when it began defining what catalogs it had, found it had two serving exactly the same purpose, and discontinued one of them. So, it helps everyone to clarify, for one purpose or another, exactly what the library does, as that is one step in the direction of a better organized and more efficient library.

Catalog Cards

When, at the end of the day, the center staff dismounts the tape on which the day's cataloging activity has been recorded, and runs the tape against the print program, they first run the tape against the PDTs in the card format program. The computer looks at a particular record being presented to it and notes that the University of Cincinnati, for example, asked for catalog cards for a book which is to be shelved in its chemistry library. Then the computer looks for the PDTs set up for the University of Cincinnati. What are the characteristics required of cards for books in its chemistry library? What cards are needed for what catalogs? The format program sets up the cards in the way previously defined in the PDTs.

The cards are produced in pack order, i.e., all the cards for a dictionary catalog pack will be printed together in alphabetical order by heading. If a library has divided catalogs, those cards for the name-title catalog will be in one pack while the subject catalog cards will be in another pack. Cards for the chemistry library dictionary catalog would go in the chemistry library dictionary catalog pack. Cards for the main library shelflist would go into another pack in call number order, while the cards for the chemistry library shelflist would go into still another pack.

Each pack, and a pack is designated for a specific catalog, has its own symbol which the center tries to make as mnemonic as possible. The pack

symbol consists of five characters: a symbol indicating the holding library in which that catalog pack is to file and two characters designating the type of catalog for which cards in that pack are intended. The holding library symbol consists of three upper case characters. The first two letters are the same for all the holding libraries within an institution and stand for the institution itself. The third character, which need not be a letter, varies from holding library to holding library. A holding library is a collection within an institution that has at least one catalog unique to that collection. The last two letters, designating the type of catalog, are in lower case. Thus, the Ohio State University main dictionary catalog is OSUdc, its art department shelflist is OSAsl, the University of Toledo main name-title catalog is TOLnt, etc.

How much activity is generated by the libraries using the on-line system? During the life of the off-line catalog card production system, which lasted from April 1970 through August 1971, the center staff considered a good week to be one in which 5,000 cards were produced. During the first year of on-line operation, the center averaged over 13,000 catalog cards or 2,000 titles per day. The average for the first months of 1973 has risen to 17,000 cards a day. From January through June 1972 the system operated at an annual level of over 500,000 records cataloged and over 3,400,000 cards produced. An average of 6.6 cards is produced per title. On 27 April 1972, 16,212 cards were produced. This was a normal day, not a record production but not unusually low either. Of these 16,212 cards, 15,677 were first cards, 502 second cards, and 33 third cards. Thus, as one can see, relatively few extension cards are produced. Two factors reduce the number of extension cards required. The first is the use of the new ALA print train which prints eight lines to the inch instead of the six lines to the inch produced by the center's former print train. Since more lines can fit into a single card the probability of requiring an extension card has been reduced.

The second factor causing reduction in number of extension cards required is the center's policy of tailoring the cards it produces for a particular catalog or for a particular type of entry within a particular catalog. OCLC does not produce unit cards to which headings have been attached. A library may specify that it wants all tracings and all notes printed on the main entry cards, just general notes and added entry tracings on its added entry cards, and general notes and subject tracings on the subject cards, while the shelflist cards would get no notes and no tracings. Personal name subject cards in one catalog could be treated in one way and corporate name subject headings in that same catalog in another way, and an entirely different pattern chosen for a different catalog. Of course, most libraries do not get quite that specialized. All main entry cards for one institution tend to be pretty much alike as are the subject cards, etc. Sometimes the main library shelflist will contain more information than the departmental shelflists, but all of the departmental shelflists in that same institution usually will contain the same amount and kinds of information. However, it is possible that one con-

figuration of data can appear on the art library shelflist card, another configuration on the music library shelflist card, etc.

Thus, the amount of information that a library has asked to be put on a particular type of card will affect the number of extension cards required. If tracings are to be printed only on main entry cards, the chances of main entry cards requiring extension cards are greater than they would be for added entry cards that did not contain tracings. It is therefore possible to have a two-card main entry and one card for every other entry. Even if the library has asked for the same data to be put on all the cards, the length of the subject and added entry headings could cause variations in number of extension cards produced for the various entries within a particular title.

The formatting of the cards is flexible. If an added entry or subject heading requires five lines, then that heading will be assigned five lines followed by a blank line with the main entry beginning on the seventh line. If that same record contains another added entry which requires only one line then the main entry on that card will begin on the third line. Thus the cards that OCLC produces are individually formatted as the center does not believe in uniformity for uniformity's sake.

On 27 April 1972, 2,482 transactions were effected through the system. That means that the various libraries in total cataloged 2,482 books. Some of these could have been the same books, of course; there is nothing to keep the University of Dayton and Heidelberg College from cataloging the same book on the same day but that would be considered two separate transactions.

The center has found that its data base is increasing at a more rapid rate from the shared cataloging input than it is from the MARC II input provided by the Library of Congress. The number of records provided on a weekly MARC II tape varies but it averages about 1,500 records per tape. This comes to 300 records a day.

The users of OCLC are now adding an average of 600 records to the system daily for works whose records are not available in MARC II. As of 27 January 1973 the OCLC data base contained some 300,000 MARC II records provided by the Library of Congress plus 245,000 records input by its users for a total of 545,000 records. By the end of May 1973 this total had risen to over 635,000 records of which approximately half were user-provided.

As noted above, the Library of Congress MARC II tapes contain cataloging for current English language monographs only, although records for current French language monographs will be available soon. OCLC users are not restricted in the same way that LC is. The users can and do input records for any monograph as long as the characters are in the Roman alphabet; Cyrillic, Hebrew, or Chinese, etc., cannot be accepted yet. However, German, Swedish, Romanian, Vietnamese, any language that uses the Roman alphabet, is acceptable. Approximately 25 percent of locally-input records are for non-English language works.

Users also do not have any time limit and have input a number of

older titles. Wright State University in Dayton has converted its entire shelflist into machine-readable form, making available to the membership its entire collection of approximately 150,000 titles. Cleveland State University recently started converting its shelflist. As other libraries convert, more and more older material will be found in the data base.

At the beginning of this article, the author said that the impetus towards the development of OCLC was interest in a union catalog. It may seem that the union catalog concept got lost along the way, but it has not. If any library connected with the OCLC system has cataloged any work through the system, the symbol for that library is displayed at the bottom of the record whenever that record is displayed on the screen. Anyone looking at the screen can tell at a glance which other libraries have that book and have cataloged it through the system. A library also can use the terminals to do preorder searching, and if it finds that certain books are located in nearby libraries, it may decide not to purchase. Libraries request information from the system for these types of non-cataloging activities one-and-a-half times as often as for use in cataloging.

What the center is working towards, in addition to the union catalog facility that now exists, is a true interlibrary loan system by which one user can arrange to borrow books from another through the terminal. This interlibrary loan system is now in the developmental stage. What the center can show now is which library has the work; the mechanics of arranging the loan must still be the traditional ones.

In addition to the Advisory Committee on Cataloging which has already been mentioned, the center has an Advisory Committee on Serials and one on Technical Processing. The function of these committees, which are composed of staff members from various OCLC member libraries, is to help OCLC design the most efficient and usable systems possible for serials control and technical processing. The Serials Control System will have three functions: check-in, claiming, and production of binding records. While serials cataloging is expected to be operational in the fall of 1973, serials check-in will not be implemented before the end of the first quarter of 1974. The claiming and binding functions will follow later. At first, the Technical Processing System will be basically an acquisitions system; it will produce purchase orders, send out these purchase orders, and keep account of funds both encumbered and spent by each library. No implementation date has been set for the Technical Processing System.

Summary

To summarize, the Ohio College Library Center has an operational on-line shared cataloging system that utilizes cathode ray tube terminals located in the user libraries. These terminals are connected to the Sigma 5 computer in Columbus by a multiple line, multiple party, synchronous transmission telephone network. From January through June 1972 the system operated at an annual level of over 500,000 titles cataloged and

over 3,400,000 catalog cards produced. In the design stage are a Serials Control System and a Technical Processing System.

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Stanford University's BALLOTS System

Project BALLOTS and the Stanford University Libraries

The library automation program at Stanford University is called BALLOTS (Bibliographic Automation of Large Library Operations using a Time-sharing System). BALLOTS is an on-line, interactive system that has been supporting the day-to-day acquisition and cataloging operations of the Stanford University Libraries since November 1972. This article describes the background and functional capabilities of the system and the hardware environment in which it operates. Library managers in the library who are responsible for running the BALLOTS system discuss its impact on library procedures and staff. Prospects for extending BALLOTS to network use are summarized.

BACKGROUND

In early 1967, following a period of rapid growth in library staff and in the volume of items processed, Stanford University received a grant (and a subsequent extension) from the U.S. Office of Education (USOE) to create a flexible and reliable on-line system for bibliographic control. The focus was on supporting library technical processing in order to reduce the clerical workload by placing the burden of repetitive tasks on a machine system; using a time-sharing computer already serving several groups of users; creating an on-line system with multifile and multiindex capabilities; and using video display units. The design of the system was to allow for its extension, in phases, from technical processing support to other areas of library operations and eventually to other libraries. Additionally, a long-term project goal was to reduce per-unit costs for acquisition and cataloging while allowing the library to handle more materials without a proportional increase in the size of the staff.

Under the two USOE grants, a prototype acquisition system (BALLOTS I) was designed and implemented by BALLOTS in collaboration with SPIRES (Stanford Public Information Retrieval System), a Stanford project funded by the National Science Foundation.[1] BALLOTS I was op-

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erated for a nine-month period in 1969 in the Stanford University Libraries. At the end of this period, the system was evaluated and the design of the production version begun. User response to the prototype system was excellent. Library personnel who were borrowed part-time from library departments in order to staff specialized data preparation and input units learned to operate the system in one-third the planned training time. Typewriter terminals were used because at that time no economical or suitable video display unit was found, but these terminals proved to be noisy and slow. User-initiated backup procedures were required to ensure file protection—a practice that proved inadequate. The BALLOTS I prototype system was too costly for production operations.

After the prototype evaluation, the requirements for the production system were clear: (1) reliability—minimum downtime; (2) rapid recovery time; (3) file integrity—procedures had to be designed into the software that would protect all files from user-, program-, or equipment-initiated failure; (4) cost acceptability—in the long run, the system would have to be able to handle an increasing volume of work at a cost equivalent to or less than the cost of a manual system handling comparably increasing workloads; (5) procedural integration—the system had to be integrated into the day-to-day work of the acquisition and cataloging departments rather than segregated in specialized units.

In 1972, BALLOTS applied for and received a two-year joint grant from the Council on Library Resources and the National Endowment for the Humanities to implement a series of ten cumulative technical processing "modules" or sets of capabilities.[3] This work resulted in the operational BALLOTS II production system described below.

The development cycle for each system module included the following steps: (1) determine the system requirements; (2) prepare written specifications; (3) update these specifications in response to library and programmer review; (4) program (including design, coding, checkout, and documentation); (5) perform system acceptance testing (both systems analyst and library user testing); (6) train users; and (7) begin production. Because of the extensive acceptance testing before production, parallel operations in the library were not carried on after the onset of production.

Currently, the BALLOTS staff is organizationally part of the Stanford Center for Information Processing (SCIP), reporting to the associate director for library and administrative computing. The project director and staff also have a dotted-line relationship with the Stanford University Libraries and are represented on the library's organization chart as the Automation Department.

SYSTEM OVERVIEW

BALLOTS II (hereafter referred to simply as BALLOTS) has been in continuous production at Stanford since November 1972, when the first module was implemented, providing comprehensive on-line technical pro-

cessing services in the Stanford University Libraries.

For the Acquisition Department, the system supports the ordering, claiming, canceling, receiving, and in-process control of monograph materials arriving on regular or standing orders; the receiving and in-process control of materials received on approval or blanket plans, by exchange, or gifts; the ordering, claiming, and canceling of serials; and the procurement control of out-of-print materials. Claiming for serials includes automatic follow-up until the first piece of a new subscription is received; claiming for all other materials (including standing orders for terminal sets) includes automatic follow-up of orders on a regular schedule until the entire order is filled or canceled.

For the Catalog Department, the system supports the in-process control, cataloging, and records maintenance of all materials (monographs, serials, terminal sets, microtexts, etc.) cataloged in the roman alphabet, including transliterated Cyrillic. The system also enables one to establish automatic, repeated standing searches against the BALLOTS MARC file; this capability will be described later.

As one result of each day's on-line activity in the library, the following morning the library receives all the printed documents required in processing. So-Lin spine labels are printed at a computer typewriter terminal in the library.

The BALLOTS system uses programmable CRT (cathode ray tube) terminals in the library that are connected to an IBM 360 model 67 computer, approximately one mile away. This computer also supports the faculty and student academic and research computing. About 2,000 computing jobs, in addition to BALLOTS, are run on this computer each day. The on-line portion of BALLOTS utilizes approximately 3 percent of the computer capacity during normal working hours.

FILES AND INDEXES

The system supports several on-line files accessible through a powerful set of indexes. Currently, in addition to the BALLOTS MARC file, there are three generic types of files that may be created: (1) in-process—containing bibliographic and acquisition or in-process control information; (2) catalog data—containing bibliographic and holdings (shelving location, copy number, and call number) data; and (3) reference—containing see, see also, and explanatory references to catalog data. At this time, two libraries (the Stanford University Libraries system and the Meyer Undergraduate Library) have their own in-process, catalog data, and reference files. For a particular library, the in-process, catalog data, and reference records appear to belong to separate files. In fact, there is a single file; index qualifiers specify the library to which a record belongs and whether the bibliographic record being searched is in process, has been cataloged, or both, or if it is a reference entry that refers to another form of entry used in catalog data file records.

The characteristics and use of the MARC and other files are discussed below, followed by a discussion of each index.

MARC File

The MARC file is updated once a week with records received from the Library of Congress (LC) on magnetic tape. LC MARC tapes are converted into BALLOTS internal format and incorporated into the MARC file and its indexes. Records may be copied from the MARC file for inclusion in the in-process or catalog data file, and they may be altered in the in-process or catalog data file, but they are never changed (by the user) in the MARC file. If a revised MARC record arrives, the first record is deleted and replaced by the revised version. This automatic replacement of MARC data occurs only in the MARC file.

There are four indexes to the MARC file that may be used alone or in combination to search the file. These are

1. personal name,
2. corporate/conference name,
3. title word, and
4. Library of Congress card number.

In-Process File (IPF)

The IPF contains bibliographic and acquisition information for items on order or in process. If a title is ordered from a record found in the MARC file, the IPF entry for that book will contain a copy of the MARC record (either unmodified from MARC or modified at time of order by the user) and the acquisition information input at time of order. If a record is not found in the MARC file for the title to be ordered, and the title is not an added copy to a book already in the system (i.e., a record for the title does not already exist in the IPF or the catalog data file), then the Acquisition Department enters the most reliable bibliographic description available for the item. When the bibliographic description of an item is input, its source is indicated for later use in cataloging.

If the book ordered is an added copy to a title already in the catalog data file, the catalog data file record is used to order the added copy. Acquisition data are added and the catalog data file record can then be retrieved as an IPF record. Every physical item ordered or in process is represented by a separate set of data elements in the IPF record for that title, so that partial receipts, partial claims, and other partial record transactions can be handled. Status information attached to each item clearly indicates the location of each item or items in the stream of technical processing activities.

When all the technical processing for a title in the IPF is completed (i.e., the items in process are cataloged or the order canceled), the IPF status of the record is deleted from the indexes to the record, the acquisition information is deleted, and only a catalog data file record remains.

The IPF has five indexes that can be used alone or in combination to search the file. Four of these indexes are the same as those for the MARC file, and function in exactly the same manner. The additional fifth index is

5. BALLOTS record identification number.

Catalog Data File (CDF)

The CDF contains complete bibliographic descriptions and holdings information (i.e., the copy number and shelving location of each copy) for items cataloged. The IPF record becomes a CDF record at the time the book is cataloged through the automated system. The bibliographic descriptions of items cataloged may come from various sources, e.g., MARC records, LC or NUC book catalog copy, Title II cards, LC proof slips, or original cataloging efforts. All bibliographic descriptions except MARC copy are keyed into the system by the user, either at the time of acquisition or at the time of cataloging. These records are reviewed during cataloging and are upgraded or modified as necessary to conform to cataloging conventions.

The CDF has the same indexing scheme as the IPF plus two more valid indexes

6. Library of Congress subject heading, and
7. call number.

Reference File (REF)

The REF file contains all the references required to locate a title in the catalog data file. These records are of three basic types: (1) see references, (2) see also references, and (3) explanatory/history references. The REF indexes are

1. personal name,
2. corporate/conference name,
3. title word,
4. subject heading, and
5. BALLOTS record identification number.

Standing Search Request File (SSR)

A library may, using this file, institute an automatic regular search of the MARC file for entries expected to appear in a future weekly LC MARC tape. These automatic searches of the MARC file may be repeated for any number of months specified by the user. With this file, a library has the option of delaying original cataloging until an expected MARC record arrives and is added to the MARC file.

Indexes

Each BALLOTS file is accessible through a variety of indexes (see Table 1).

Table 1. BALLOTS Files and Indexes

	Index						
Files	LC Card Number	Personal Name	Corp/Conf Name	Title Word	LC Subject Heading	Call Number	BALLOTS Record ID Number
MARC	X	X	X	X			
Catalog Data	X	X	X	X	X	X	X
In-Process	X	X	X	X			X
Reference		X	X	X	X		X

1. Personal name (PN) index. If values exist in a record for any personal author data elements, the personal name portions of those values (i.e., excluding dates and relators like joint author or title) are indexed in the PN index. Title portions of author/title entries are indexed in the title word index. A series statement personal name is indexed only if it is traced in the same form.
2. Corporate/conference (CN) name index. The CN index is a "word" index. In a word index, every significant word in the value of an indexed data element is indexed. Frequently occurring words, such as institute, are not indexed. Title portions of author/title entries are indexed in the title word index. A series statement corporate or conference author is indexed only if it is traced in the same form.
3. Title (T) word index. The T index is a word index like the CN index.
4. Library of Congress card (CRD) number index. The one BALLOTS data element indexed in this index is the LC card number, and only the numeric portion (excluding revision, prefix, and suffix notations) is indexed. It is indexed for MARC, IPF, and CDF records.
5. The BALLOTS identification (ID) number index. Each record in an IPF, CDF, or REF file has a unique ID number that is added to the record when the record is created. The final digit is a check digit.
6. Subject (S) index. Only topical and geographic subject headings are included in this index for records in a CDF or REF file. The subject index is not a word index; the whole subject heading is treated as a single index term.
7. Call number (CAL) index. The CAL index is valid only for records in a CDF. The only data element indexed is the holding library's call number.

SEARCHING THE BALLOTS FILES

The BALLOTS search logic can be quite simple or quite elaborate. Simply stated, the user at the terminal keys a search request composed of the basic command "find," a valid name of the index to be used, and a value or valucs to be located. "Find t fire" will cause the system to gather a list of the records in the file that conform to this criteria—i.e., those that have the word "fire" somewhere in a data element indexed in the title word index (T). By using Boolean operators ("and," "or," "not") and requesting

searches of more than one index at a time, the user can make his search broad or specific, depending on his purpose in searching the files.

An author's name in the personal name index can be searched for in a variety of forms. For example, the following variations, or any combination of them, would be accepted as valid search terms and would locate the same record:

White, J.E.M.	(initials)
White, M.	(some initials omitted)
White, J E M	(initials without periods)
white, jo.: ewbank manchip	(capitalization ignored)
J.E.M. White	(surname first or last)
Manchip White, J.E.	(surname first or embedded)
White, Jo Ewb Man	(implicit truncation of forenames)
Whi#, J.E.M.	(explicit truncation of surname through use of pound sign)

The BALLOTS system makes extensive efforts to recognize different versions of a personal name because the exact form of an author's name is not always known.

A user may truncate an index value using the pound or number sign; e.g., "find CN librar# automation" will retrieve all the entries in the corporate/conference index beginning with "librar" (libraries, library, librarian, etc.) and the word automation. The words need not occur in that order since each word is indexed separately. As another example, "find CAL QD450#" will retrieve all records indexed in the call number index with a call number that begins with QD450.

A subject heading search can be made as specific or as general as desired by the user. For example, "find subject Art#" will retrieve all entries in the subject index that have "art" as the first three letters (artists, artistic, art nouveau, etc.). This, of course, is liable to result in unmanageable output, so the user could specify a further criterion—"find subject Art# 19th Century," which would retrieve all the entries in the subject index with the character string "19th Century" coming somewhere after the string "art." When the truncation symbol is used to stand for words interior to the subject heading, there is implicit truncation at the end of the subject heading.

Each index term is qualified to indicate to which logical file (MARC, IPF, CDF, or REF) and to which library the associated data belongs. The user can specify the files he intends to search, or BALLOTS will establish a default sequence of files. If the initial search of a file yields no results, the system automatically goes on to search the next file in the sequence. If a single record is found in a file, the system automatically displays it for the user. If more than one record is found that meet the search criteria, the system informs the user of the number of records matched. At this point, the user can narrow the search by specifying additional requirements in an interactive session with the system. If he derives too few or

zero results as a consequence of his commands, the system will retain the last non-zero result obtained, or the user may issue the "backup" command to reinstate the most recent result stack.

The user can now give the command "display," and BALLOTS will show him the first record of the result stack (the records retrieved in the search) on the CRT terminal screen. Paging commands can be used to see each record in turn, moving forward or backward through the result stack.

The display of data in searching is organized to be as meaningful as possible for the specific task. Data can be displayed on a variety of CRT screen formats. Depending on his choice of display format, the user can browse through search results at the level of the bibliographic information or at the level of the acquisition or holdings information.

TECHNICAL PROCESSING SUPPORT

BALLOTS technical processing support is divided into nine computerized functions: ordering, receiving, non-purchase-order material receipt, claiming and canceling, cataloging, in-process material distribution, catalog records maintenance, reference input and maintenance, and standing search removal. In addition, there is a tenth function that supports Meyer Undergraduate Library reserve book processing.

The user interacts with the system in each function at the CRT terminal by means of a unique "protocol," i.e., a prescribed and ordered set of user commands and display and input formats. Each protocol has two parts or modes: searching (discussed above) and record input/update. The protocol guides the user through his work, provides him with the appropriate subset of data, and ensures that all the necessary steps in the task are completed. By using a protocol to support particular technical processing activities, the system can (1) optimize the normal sequence of actions, (2) enable the user to deal with any exceptional situations that might arise, and (3) disable all actions that are extraneous or detrimental to a given activity. The protocol sets up boundaries to orient the user. Through the use of protocols, the system makes it as evident as possible what can, cannot, should, and should not be done at a particular point in a function.

In the input/update mode, information is presented to the user on the input/update CRT screen formats. Each protocol has a set of input/update formats for bibliographic information, for holdings information (call number, shelving location, etc.), and for acquisition information. The formats are designed to present as much recognizable information and as many valid associations as possible to the user. Data are always displayed in the same order and position, and wherever possible, each data element is prefaced with a mnemonic tag. In the design of these formats, careful attention was paid to spacing and alignment to clarify visually the distinction between tags and data.

The user is prompted with the commands for the most common route through a protocol, as a default option. Each screen format contains a

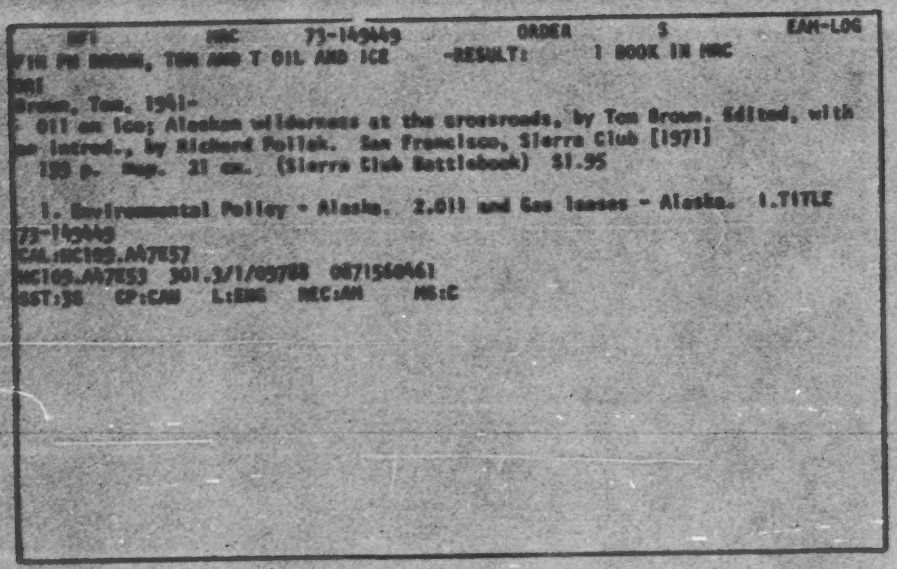
INFI NMC 73-149449 ORDER S EAM-LOG
FIN PH BROWN, TOM AND T OIL AND ICE -RESULT: 1 BOOK IN NMC
001
Brown, Tom, 1941-
. Oil on ice; Alaskan wilderness at the crossroads, by Tom Brown. Edited, with
an introd., by Richard Pollak. San Francisco, Sierra Club [1971]
159 p. map. 21 cm. (Sierra Club Battlebook) $1.95
1. Environmental Policy - Alaska. 2.Oil and Gas leases - Alaska. I.TITLE
73-149449
CAL:NC102.A47E57
NC102.A47E53 301.3/1/09788 0871560461
SST:SS CP:CAN L:ENG REC:AN MS:C

Fig. 1. Full Bibliographic Display Format.

command field (line 3 of 24) in which the system prompts a default command that will produce the next step in the main line of that protocol. Thus, the user does not need to take any special actions to deal with the usual cases. In Figure 1, the format name ("OR1"—order input) to order a copy of the title is prompted by the system in the command line. Figure 2 is a sample of the bibliographic input/update format that a user would call for in order to alter some bibliographic information.

The command prompts are independent of the particular screen format on which they appear, since the same format may be used in several different protocols. For example, the format for input of basic bibliographic information (Figure 2) may be used to produce a purchase order or to produce a set of catalog cards. In other cases, a format that is required in one protocol may be optional in another.

The user can also instruct the system by command to take one of the options in a protocol. When it is necessary to depart from the common route, the user simply overwrites the prompted command with some other command.

BALLOTS programs perform on-line editing of the data elements on input/update formats. By testing the input data element values according to certain rules or against internal files of valid codes, the system immediately determines whether or not they are valid. After editing the data, if an error is detected, the system redisplays the input/update format, beginning with the first line in which an error occurs. The correct lines above this point are not redisplayed, although the user can have this done upon

```
    BII          S-IPF    73-149449          ORDER        S          EAM-LOG
ORI
   SST 3S          REC AM              CP CAU          L ENG       TSTI Y
  TSUT
   ME- PN Brown, Tom, 1941-
   TST Oil on ice;
  TSSB Alaskan wilderness at the crossroads,
  TSRT by Tom Brown. Edited, with an introd., by Richard Pollak.
    ED
    PP San Francisco, Sierra Club
     D [1971]
    PG 159 p.
   ILL map.
    SZ 21 cm.
   LPR
   CRD 73149449          CRDS                        NUC
    LC MC109.A47E57                                              MS C
   LCA
    DC 301.3/1/09788
  ISBN 0871560461
                                                                 GPC
   SUP
   PUX
   RIP
```

Fig. 2. Bibliographic Input/Update Format.
Bibliographic information for a new title may be updated, as required, in the ORDER function.

command, if needed. A two-digit code, indicating the nature of the error, now appears in front of each invalid field. When the errors have been corrected, the format is transmitted a second time and the data are then accepted.

When all the formats needed to perform a function have been filled in by the user and accepted by the system, the transaction is considered complete. The system then responds "ENTRY PROCESSED–ID = <number> –PDQ = <number>." If the bibliographic record is from the MARC file or has just been created, a machine-generated ID number is assigned to the record, and the record will be added to the appropriate file. If a record already in a BALLOTS file is used, the additional order or catalog information is appended to the existing record. A Print Data Queue (PDQ) number is a key assigned to the entry for overnight batch processing of a transaction where printed outputs are to be produced.

The user has immediate access to all the information input in a day and can examine an updated or just-created record as soon as the system has accepted its entry. Access to new records is limited to the use of the ID index until the following day. From then on, the records can be located through any of the available indexes.

All printed outputs except the Se-Lin spine labels are printed on a high-speed printer at the Academic Computing production services center. Members of production services support BALLOTS production around the clock. During BALLOTS on-line production hours, from 8:30 a.m. to

5:00 p.m. Monday through Friday, when the library staff are searching BALLOTS computerized files and inputting data at the CRT terminals, operators and library staff communicate with each other via telephone about problems with hardware and software. The operators notify the library if any part of the system must be taken out of service. Production services is also responsible for seeing that the terminals are working properly. All BALLOTS batch production programs are run during Academic Computing's third shift (midnight to 8:00 a.m.). These jobs are run on a regular daily, weekly, and monthly schedule. A courier delivers printed outputs to the library every morning.

LIBRARY VIEW

The Acquisition Department

When BALLOTS was in the design stage, the Acquisition Department was promised a system that would, to a large extent, eliminate the paper in-process file, which, owing to its single access point, generally hindered order searching. In this regard, BALLOTS was eminently successful. The bibliographical searchers and the receiving, claiming, and canceling personnel no longer plow through copies of orders that represent in-process materials; no manual files are retained. The variety of access to BALLOTS files has added to the efficiency of the search process and has significantly reduced the repetitive, error prone typing of data. Additionally, typing orders and interfiling order slips are tasks that are no longer required; orders, requester notices, etc., are now generated by the computer. Claims and cancellations to vendors are now machine-generated (largely automatically), thereby decreasing the manual staff input formerly required. The BALLOTS automatic claim support has increased the service that now can be offered to requesters by ensuring timely, regular claims for materials, rather than waiting for serendipity. All of this translates into a staff saving of six positions or 33 percent of the Order Division.

Contrary to expectations, the imminent implementation of BALLOTS and the required training in late 1972 did not intimidate the staff. In time, everyone in the Order and Gift and Exchange divisions was fully trained in the system, even a person six months from retirement. People in the Serials and Binding and Finishing divisions were trained as required. Although the rate of learning varied, no one failed to master the use of BALLOTS.

Work processes have changed since BALLOTS became operational, with batching of tasks the most notable change. A limited number of available CRT terminals has necessitated scheduling terminal use and thus the batching of work. It has been possible to broaden searchers' duties; where they were formerly restricted to "African" or "science" searching, these narrow specialties may now be eliminated in favor of a general list of duties. Also, searchers now assume some responsibilities for claims and

cancellations. The old routine of acquisition processing is now far from routine.

Although ordering and receiving backlogs have essentially been eliminated, there are new challenges for library administrators who must manage formerly manual departments that are now almost totally integrated with the BALLOTS services. First, the distinctions between acquisition and cataloging have blurred, and a departmental procedural integration is now underway. Nothing less than processing certain types of materials at time of receipt and producing catalog cards and spine labels will certainly become part of the Acquisition Department. Books may then bypass the Catalog Department and go from the receiver to the Binding and Finishing Division for stamping and labeling.

A second challenge is the value that staff place on their services once they are fully trained in the BALLOTS system. A significant learning process is required to master the BALLOTS acquisition functions; but does such learning significantly alter the personnel classification and pay of a bibliographical searcher? This is a question that has not yet been fully resolved.

The Catalog Department

In the past year, the Catalog Department has evolved from technical services based on manual procedures plus some automation support to an automated technical processing operation with some residual manual support. All staff members have been trained to use the BALLOTS system in some capacity and every functional unit utilizes the system in its daily work.

In 1973–74, the production level increased 3 percent over the previous year, and the arrears were reduced by 5.7 percent. These advances were made despite a 5.6 percent reduction in the effective work force for the entire reporting period. BALLOTS was a major factor in the increased productivity of the department. With the implementation of each module, production dropped during the periods of acceptance testing and staff training. Following a month of adjustment, there was a steady increase in production until implementation of the next module.

As of November 1974, approximately 80 percent of all titles cataloged were cataloged through BALLOTS (includes original cataloging and copy processing). Of all added copies processed, 30 percent were processed through BALLOTS and 36 percent of the added volumes were BALLOTS processed. By early 1975, BALLOTS is expected to process 90 to 95 percent of all titles handled by the department. Much manual processing was still necessary when the department began using the first module (BALLOTS MARC), but with the added capability of each successive module the only categories currently processed manually are manuscripts, sheet maps, and nonroman, nontransliterated languages.

Card preparation functions have been most affected by BALLOTS. Card duplication, heading typing, card set preparation, and card arranging were

major activities in the manual system. These functions have been nearly eliminated, producing a positive offset of 5.5 FTE. All residual card duplication has been transferred to the Photoduplication Division, relieving the Catalog Department of all card duplication. Mainly as a result of BALLOTS card production capability, fourteen typewriters were released from the department for use elsewhere in the library.

Involvement in BALLOTS development, testing, and training was a time-consuming but essential activity for several key members of the department. Work with BALLOTS staff in the development effort on each module, review of system specifications, development of training materials, acceptance testing, and hands-on training had a considerable impact on the work and availability of these key staff members. Several staff members were involved full-time and several others part-time for one to two months with each module that had a major effect on cataloging procedures.

Work patterns have changed as a result of on-line bibliographic processing. Access to the terminals is scheduled for staff throughout the day with open periods at noon and in the late afternoon. This scheduled access requires that work be batched and well-organized before the staff member comes to the terminal, and it affects each staff member's sequencing of preparatory work and other departmental activities.

Catalogers have the option of keying in their original cataloging or giving worksheets to support staff for input. The criterion for a cataloger's continued use of the system should be the manner in which the cataloger utilizes the system. If it is used only for input of bibliographic records, the input should be done by support staff. If the cataloger uses on-line files as a cataloging aid, this use should continue.

Differences in file organization between manual and machine systems have forced a reexamination of reference structure and search strategies. The card catalog tends to bring files together through reference structure and inverted entries. Machine file indexes are structured in such a way that files are split. The differences in required reference structure and search strategy between the two types of files have made necessary the training and reorientation of the staff in the maintenance and effective use of the machine-based files.

Several other areas affected by BALLOTS are discussed below, though the listing is by no means exhaustive:

1. Titles with MARC copy—are processed earlier in the flow of work, reducing the handling and the processing time lag. A procedure will soon be initiated to process these books in the Acquisition Department receipt function. The books will then bypass the Catalog Department and go directly to end processing.
2. BALLOTS distribution function—provides an on-line control of books in the department, to the level of a cataloger's desk if necessary, greatly reducing the frequency and time necessary for requests for books in process.

3. Standing search requests—provides a more systematic approach in matching LC copy with books on the holding shelves and reduces the required staff time for this function.
4. Title II filing—has been reduced by about one-third since cards are not filed if the title is included in the on-line MARC file. With an expanded MARC scope, Title II filing may be eliminated altogether.
5. Statistical counts—have been simplified as a result of BALLOTS-generated statistics.

The Catalog Department staff have enthusiastically accepted the BALLOTS system and generally adapted quite well to an on-line environment. The system has had a very positive impact on the department.

The Total Library

The possibility of realizing labor savings was conceived in the original BALLOTS design. To measure the savings, four offset studies have been conducted. The first was a theoretical model done prior to implementation; it estimated labor savings of $160,000. The second, third, and fourth studies were done at progressive intervals during the implementation of BALLOTS as a production system. Each of the latter studies addressed itself only to modules in BALLOTS that were in full production at the time of the study. As each new module introduced new facilities and services, the tendency has been for the offset to increase with each study. However, in comparison with the original estimate of $160,000, the results have been modest. Currently, the offset is estimated at 11.5 FTE positions, all at a clerical level, equivalent to about $88,074 when 15 percent staff benefits are included. (This figure is based upon a beginning salary level; offset is actually higher if longer term employees are considered.) Some additional offset is expected.

It may be thought that BALLOTS has realized no offset in professional time. This is not true in that certain activities assigned to professionals were eliminated through procedural changes (e.g., proofreading of overtyped headings on cards). Strictly speaking, these changes were not required by automation, but in fact were implemented in connection with it. Of course, much of the beneficial offset realized by these procedural changes has in itself been offset by the time required to train and supervise the support staff. But this will not go on forever at the intensive pace that was required during development. Indeed, the greatest evidence that significant additional offsets will be realized is the fact that throughout the development of, training for, and installation of numerous modules, production has consistently risen as staffing has declined. As the system stabilizes, less training and supervision will be needed, and additional procedural changes will be implemented. Foremost among the latter is physical repositioning and procedural integration of acquisition and cataloging to permit a straight-through flow of library materials. It is expected that this physical move will be followed by significant organizational change, aimed at

obtaining additional efficiencies. No organizational changes are planned until the integrated operation has been sufficiently studied and observed to know what new procedures will make best use of the staff and the system. In combination, it is hoped that such changes will produce maximum realizable offset.

HARDWARE AND SOFTWARE

The BALLOTS CRT terminals are located in the Stanford main library in the Acquisition and Catalog departments. These terminals are connected via twisted pair cables to a multidrop box (Stanford-built modem) that acts as a shared data set, and then to a PDP-11/40 minicomputer in the academic computing branch of the Stanford Center for Information Processing (SCIP). The PDP-11, in turn, is connected to an IBM 2701 parallel data adapter which is connected to a selector subchannel on the 360/67 computer. The 360/67 runs BALLOTS along with general time-shared and batch campus computing jobs. BALLOTS runs as a subprocessor under ORVYL, the time-sharing monitor developed at Stanford. ORVYL uses the virtual memory capabilities of the 360/67. MILTEN, the terminal executive, is currently able to connect simultaneously about 125 interactive terminals of various types through both an IBM 3705 and the PDP-11 front-end communications controllers. The PDP-11 supports all the high-speed CRT display terminals. Simple display terminals such as the Tektronix 4023 are supported one to a line, while the intelligent terminals used by BALLOTS are multidropped—several terminals share a line. The BALLOTS files are stored on CDC 23142 double-density direct-access disk drives. The high-speed printer used for these jobs is an IBM 1403, which prints at about 350 lines per minute when an upper-lower case print chain is mounted.

The PDP-11 provides polling, buffering, translation, device transparency, terminal program loading, and some diagnostic capabilities. Whereas the 360/67 can interrupt the PDP-11 whenever the 360/67 has data to send, communication between the terminals and the PDP-11 is done on a polled basis. The PDP-11 continually asks each terminal if it has data to send. If a terminal is not active, the PDP-11 places it in a lower priority status and polls it less often than the active terminals. Once the terminal becomes active, it requires the more frequent polling status. The PDP-11 buffers the transfer of data back and forth between the terminals and the 360/67. In order to save core in the PDP-11, data can be transferred from the buffers in the PDP-11 directly to memory in the BALLOTS subprocessor within the time-sharing monitor. Therefore, as opposed to the implementation of the low-speed typewriter terminals, the PDP-11 implementation does not require buffering within the terminal executive (MILTEN) to handle the data.

The 360/67 sends and receives all data in EBCDIC character code. The PDP-11 does the translation for ASCII character code terminals. The

PDP-11 also translates control codes, such as "clear screen" and "home cursor," to fit the particular needs of each terminal. This provides a degree of device transparency to the programs in the 360/67. The PDP-11 contains a copy of the program that runs in the BALLOTS programmable terminals. On request from one of those terminals, the PDP-11 can transmit a fresh copy of the program. This is necessary because the memory in the terminals does not retain the program when the power is turned off. The PDP-11 also supports rudimentary diagnostic and statistical services for the display terminal system.

The terminal used in the BALLOTS system is the Sanders PDS 804 programmable CRT terminal. This terminal includes a microprocessor and 4,096 bytes of programmable memory that permit specific computer programs to be loaded directly into the CRT terminal. These programs control the display of data, the keying, and the communication of the data to the main computer. This terminal can display 1,920 upper- and lowercase characters on a screen, in twenty-four eighty-character lines. Specific functions have been assigned to certain keys (such as the paging keys for displaying records retrieved from a search) to adapt the Sanders terminal to the uses of BALLOTS.

The terminal is programmed so that specified segments of lines on the screen or ranges of lines on the screen can be considered as a single data element field. These fields may be either protected or unprotected. A protected field is one in which the user cannot input data, although the system may display data there. During input at the keyboard, the cursor is prevented from entering protected fields; this constraint is part of the control program loaded in the terminal. (The cursor is a blinking underline character that indicates to the user his position on the screen.)

It should be pointed out that all of the features described here are programmed into the terminal and are not part of the hardwired logic of the terminal. This feature permits easy and convenient changes of screen design. Flexibility was one of the primary reasons for choosing a programmable terminal.

PRODUCTION COSTS

BALLOTS operating and maintenance costs are covered in the Stanford University Libraries budget. Operating costs are of five types: (1) file build and update costs, (2) on-line costs, (3) batch costs, (4) CRT terminal rental, and (5) CRT terminal connect time.

1. File costs (not including Library of Congress MARC tape subscription) consist of (a) costs for converting the MARC tapes to BALLOTS internal format, building the BALLOTS on-line MARC file and indexes, and dumping the file to tape; (b) costs for adding records to and updating the other BALLOTS on-line files and dumping these files to tape; (c) file storage costs on CDC 23142 double-density disks ($800 per month per IBM 2314 equivalent disk); and (d) general file maintenance activities, such as restoring a file.

2. On-line costs are calculated by adding up the computing accounts used by the library for work on the CRT terminals. This on-line activity includes searching the files, ordering, cataloging, establishing standing search requests for MARC records not yet received on the weekly tapes, and so on. These costs vary directly with the number of library transactions.
3. Batch costs are both fixed and variable. The fixed batch costs include the costs of mounting special forms on the high-speed printer; mounting a reserved disk pack for overnight processing; and renting the IBM 2741 typewriter terminal used to print spine labels. The variable batch costs are incurred for sorting, formatting, and printing the outputs for the library; for matching the standing search requests (SSR) file against the MARC file weekly; for purging the SSR file of outdated requests monthly; for running the weekly automatic claim program to determine orders for which claims must be produced; and for running monthly management statistics reports.
4. BALLOTS CRT terminals are rented for $270 per month with 4,096 bytes of memory. Purchase price of the Sanders 804 is approximately $8,000.
5. CRT terminal connect time is a fixed monthly charge of $1,200 for each group of from one to ten CRT terminals connected to the IBM 360/67 through the PDP-11 minicomputer.

The total monthly production and maintenance charges for November 1974 were $34,255. Of this, file costs were 56.2 percent; on-line costs were 18.5 percent; batch costs were 14.5 percent; CRT terminal rental costs were 7.3 percent; and terminal connect-time charges were 3.5 percent. System and procedural fine tuning and improvements underway and planned will reduce this monthly cost. In the long run, sharing common costs such as file building will reduce the cost to each library participating in a network. In addition, dividing and sharing original cataloging efforts and keying for non-MARC LC copy will mean direct savings. Currently, the Stanford University Libraries pay the entire cost of running and maintaining the system.

FUTURE PLANS

The application of computer technology to library operations, and the development of regional and national networks of libraries based on this technology, promise to provide help in solving the dilemma of tightening budgets versus increasing demands for libraries to serve their clientele more fully. In contrast to manual library systems, which make widespread sharing of library resources cumbersome and slow, automated library systems have the potential advantage of being used rapidly and simultaneously by more than one institution. When an automated system is shared by a network of libraries, the price tag of the system to each user is reduced and the rising costs of the highly labor-intensive library environment are curbed.

The benefits of automated library systems are not just economic. Shared computer systems provide libraries with access to more than the resources of their own collections. Libraries in a network can share the entire network's joint bibliographic resources with students, faculty, staff, and the community at large. Resource sharing can be optimized through coordinated purchasing and interlibrary loans, facilitated by network files accessible to all libraries in the region and by direct communication with other library networks.

Stanford has been exploring with in-state groups the possibility of a California library automation network. The plan is to utilize BALLOTS as the on-line vehicle for a network that would incorporate the major complementary capabilities and data bases of other existing systems in the state. In addition, BALLOTS has been asked by out-of-state groups to explore the possibility of communication between the California network and other networks and bibliographic centers in the western region, where the feasibility, logical rationale, and need for the benefits of such communication all exist.

BALLOTS' approach is to seek to pool resources in order to form a reliable, flexible, and economical network to support and improve the services provided in common by every type of library in the state—public, private, large, small. The plan is to make this a regional network, adhering to national standards and capable of communicating with other systems and networks in California and other states.

CONCLUSION

The BALLOTS system design includes several unique features. The most notable of these are the flexible interactive searching capability; the standardized screen formats; the protocol structure and the command language associated with it; the programmable CRT terminal that aids the user in input and display; and the fact that an entire screen full of data is entered and processed at one time, rather than just one data element at a time.

The BALLOTS system is intended to provide a library tool used in the library's daily production environment. The system was designed with the help of the library and is being used by the regular library staff. The BALLOTS system is designed to stimulate the user's motivation. The system supplies routine data wherever possible, thus saving the user a great deal of repetitive keying. The on-line editing functions of the system verify the codes and either generate the appropriate data or return an error code to the user. The user receives positive confirmation each time a task is completed and a record is added to or updated in the file. Each format carries a control line identifying the function, file, and record in use. The user can refer to this information if he gets lost or confused. As a result of this careful user interface analysis and planning, no special terminal operators are required in the library. Throughout, continual efforts were

made to create a system as convenient and useful as possible to the library staff.

To date, the BALLOTS system has encountered ready acceptance by its users in the library, who find the system easy to learn and use. One of the major advantages of the system is that with a minimum of clerical effort (the searching and keying done at the CRT terminal), the library can obtain for each title searched a purchase order, vendor invoice, first and second claim notices, cancellation notices, a catalog data slip, two spine labels, catalog cards, etc.

At a number of points in the system, smoothing the way for the user has meant increasing the complexity of the BALLOTS analysts' and programmers' tasks. This paper has made no attempt to describe the program structure underlying BALLOTS operations.[3]

ACKNOWLEDGMENTS

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The search routines and file service routines used in BALLOTS were developed by members of the SPIRES project (Stanford Public Information Retrieval System); the work of Richard Guertin, William Kiefer, and John Schroeder has been vital to the success of BALLOTS.

REFERENCES

1. SPIRES is a generalized information storage and retrieval system. During BALLOTS' development phase, BALLOTS collaborated with SPIRES to define and develop overlapping requirements between the two systems. SPIRES development provided access to and retrieval of bibliographic records created through on-line transactions (e.g., BALLOTS activity) or furnished from outside sources (e.g., MARC).

   All BALLOTS on-line files have been made available publicly through SPIRES. Nearly any terminal in the United States capable of dialing Stanford's IBM 360/67 computer can search these files. Additional information on searching via SPIRES is available in a document entitled "A Guide to BALLOTS Files."
2. U.S. Office of Education, Department of Health, Education and Welfare grants OEG-1-7-071145-4428 and OEG 0-70-5237 ran from June 1967 to March 1971 and totaled $1,168,890. During that time, Stanford direct expenditures totaled $238,700.

From March 1971 to September 1972 Stanford funded all continuing development of BALLOTS, which represented direct expenditures of $283,580. In September 1972 a joint council on Library Resources and National Endowment for the Humanities grant was awarded in the amount of $650,000. This grant ended in November 1974.

3. For a description of BALLOTS software, see *Final Report of the BALLOTS Project to the National Endowment for the Humanities: September 1, 1972—August 31, 1974.* (Library Computing Services (BALLOTS Project), Standard Center for Information Processing, Stanford University, Stanford, California.)

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650 W. State Street
Boise, Idaho 83702

Idaho State University
Library
Pocatello, Idaho 83201

Illinois

Illinois State University
Library - Serials Department
Bloomington - Normal,
Illinois 61761

Southern Illinois University
Library - Serials Department
Carbondale, Illinois 62901

Eastern Illinois University
Booth Library
Charleston, Illinois 61920

Chicago State University
Library
95th Street and King Drive
Chicago, Illinois 60628

ERIC MICROFICHE COLLECTIONS

Loyola University
Julia D. Lewis Library
820 North Michigan, Room 1200
Chicago, Illinois 60611

Northeastern Illinois University
Library (CICS)
Bryn Mawr at St. Louis Avenue
Chicago, Illinois 60625

U.S. Office of Education/DHEW
Region V
226 West Jackson Boulevard
Chicago, Illinois 60607

University of Chicago
Library - Serials Records Department
Chicago, Illinois 60637

University of Illinois at Chicago Circle
Library
Chicago, Illinois 60680

ERIC Clearinghouse in Career Education
Northern Illinois University
204 Gabel Hall
Dekalb, Illinois 60115

Northern Illinois University
Swen Franklin Parson Library
Dekalb, Illinois 60115

Southern Illinois University
Lovejoy Library
Edwardsville, Illinois 62025

National College of Education
Library
2840 Sheridan Road
Evanston, Illinois 60201

Northwestern University
Library
Evanston, Illinois 60201

Western Illinois University
Memorial Library
Macomb, Illinois 61455

Moraine Valley Community College
10900 South 88th Avenue
Palos Hills, Illinois 60465

Governors State University
University Library
Park Forest South, Illinois 60466

Bradley University
Library
1501 West Bradley Avenue
Peoria, Illinois 61606

Concordia Teachers College
Klinck Memorial Library
7400 Augusta Street
River Forest, Illinois 60305

Illinois Office of Education
Media and Resources Center
100 North First Street
Springfield, Illinois 62777

Sangamon State University
Library - Documents Department
Springfield, Illinois 62708

ERIC Clearinghouse on Early Childhood Education
University of Illinois, College of Education
805 West Pennsylvania Avenue
Urbana, Illinois 61801

ERIC Clearinghouse on Reading and Communication Skills
National Council of Teachers of English
1111 Kenyon Road
Urbana, Illinois 61801

University of Illinois
Library - Documents Division
Urbana, Illinois 61801

Indiana

Indiana University
School of Education Library
Bloomington, Indiana 47401

School Research Information Service (SRIS)
Phi Delta Kappa
8th and Union Street
Bloomington, Indiana 47401

University of Evansville
Library
Evansville, Indiana 47702

Saint Francis College
Library
2701 Spring Street
Fort Wayne, Indiana 46808

Purdue University
Library - Serials Unit
Lafayette, Indiana 47907

Ball State University
Library
Muncie, Indiana 47306

University of Notre Dame
Memorial Library
Notre Dame, Indiana 46556

Indiana State University
Cunningham Memorial Library
Terre Haute, Indiana 47809

Iowa

Iowa State University
Library
Ames, Iowa 50010

University of Northern Iowa
Library - Serials
Cedar Falls, Iowa 50613

Drake University
Cowles Library
28th and University
Des Moines, Iowa 50311

Iowa State Department of Public Instruction
Library
Grimes State Office Building
Des Moines, Iowa 50319

American College Testing Program
Library
Iowa City, Iowa 52240

University of Iowa
Library
Iowa City, Iowa 52242

Kansas

Emporia Kansas State College
William Allen White Library
Emporia, Kansas 66801

Fort Hays Kansas State College
Forsyth Library
Hays, Kansas 67601

University of Kansas
Library
Periodicals Section
Lawrence, Kansas 66044

Kansas State University
Library
Manhattan, Kansas 66506

Johnson County Community College
Educational Media Center
College Boulevard and Quivira Road
Overland Park, Kansas 66210

Kansas State College of Pittsburg
Porter Library
Pittsburg, Kansas 66762

Kansas State Department of Education
120 E. 10th Street
Topeka, Kansas 66612

Wichita State University
Library
Wichita, Kansas 67208

Kentucky

Western Kentucky University
Margie Helm Library
Bowling Green, Kentucky 42101

Kentucky Department of Education
Professional Library, ERIC Center
State Office Building
Frankfort, Kentucky 40601

Northern Kentucky State College
Library
Louis B. Nunn Road
Highland Heights, Kentucky 41076

University of Kentucky
Margaret I. King Library
Government Documents Department
Lexington, Kentucky 40506

University of Louisville
Main Library
Belknap Campus
Louisville, Kentucky 40208

Morehead State University
Johnson Camden Library
Morehead, Kentucky 40351

Murray State University
Library
Murray, Kentucky 42071

Eastern Kentucky University
John Grant Crabbe Library
Richmond, Kentucky 40478

Louisiana

Louisiana State University
Library - Social Science Division
Baton Rouge, Louisiana 70803

Louisiana State Department of Education
Research Coordinating Unit
626 N. Fourth Street
Baton Rouge, Louisiana 70804

Grambling State University
Grambling, Louisiana 71245

Southeastern Louisiana University
Sims Memorial Library
Hammond, Louisiana 70401

University of Southwestern Louisiana
Dupre Library
Lafayette, Louisiana 70501

McNeese State University
Frazer Memorial Library
Lake Charles, Louisiana 70601

Northeast Louisiana University
Sandel Library
Monroe, Louisiana 71201

University of New Orleans
Earl K. Long Library
Lake Front
New Orleans, Louisiana 70122

Louisiana Technological University
Prescott Memorial Library
Ruston, Louisiana 71270

Nicholls State University
Library
Thibodaux, Louisiana 70301

Maine

Maine State Department of Education
Planning and Evaluation, ERIC Office
State House
Augusta, Maine 04330

University of Maine
Raymond H. Fogler Library
Orono, Maine 04473

Maryland

Ann Arundel County Public Schools
Media Service
2644 Riva Road
Annapolis, Maryland 21401

Johns Hopkins University
Milton S. Eisenhower Library
Baltimore, Maryland 21218

Loyola College
Library
4501 North Charles Street
Baltimore, Maryland 21210

Maryland State Department of Education
Media Services Center
B.W.I. Airport
Baltimore, Maryland 21240

Towson State College
Albert S. Cook Library - Serials
Baltimore, Maryland 21204

ERIC Processing and Reference Facility
Operations Research Inc., Information Systems Division
4833 Rugby Avenue, Suite 303
Bethesda, Maryland 20014

Bowie State College
Graduate Division
Library
Bowie, Maryland 20715

University of Maryland
College of Education, Room 0102
College Park, Maryland 20742

University of Maryland
McKeldin Library
Serials Division
College Park, Maryland 20742

University of Maryland - Eastern Shore
Library
Princess Anne, Maryland 21853

Montgomery County Public Schools
Educational Materials Laboratory
850 Hungerford Drive, Room A-41
Rockville, Maryland 20850

Salisbury State College
Blackwell Library
Salisbury, Maryland 21801

Western Maryland College
Library
Westminster, Maryland 21157

Massachusetts

University of Massachusetts
Graduate Research Center
Library
Amherst, Massachusetts 01002

Boston Public Library
666 Boylston
Boston, Massachusetts 02117

Boston State College
Library
625 Huntington Avenue
Boston, Massachusetts 02115

Boston University
School of Education
765 Commonwealth Avenue
Boston, Massachusetts 02215

Massachusetts Board of Education
Greater Boston Regional Education Center
Boston, Massachusetts 02133

Massachusetts Department of Education
Department Library
182 Tremont Street, 11th Floor
Boston, Massachusetts 02111

Massachusetts Teachers Association
20 Ashburton Road
Boston, Massachusetts 02108

Northeastern University
Library
360 Huntington Avenue
Boston, Massachusetts 02115

U.S. Office of Education/DHEW
Region I
John Fitzgerald Kennedy Federal Building
Boston, Massachusetts 02203

Bridgewater State College
Maxwell Library
Bridgewater, Massachusetts 02324

Northeastern University
Suburban Campus
Burlington, Massachusetts 01803

Harvard University
Graduate School of Education
Monroe C. Gutman Library
Appian Way
Cambridge, Massachusetts 02138

New England Resources Center for Occupational Education
44 Battle Street
Cambridge, Massachusetts 02138

Merrimack Education Center
101 Mill Road
Chelmsford, Massachusetts 01824

Boston College
Library
Chestnut Hill,
Massachusetts 02167

Fitchburg State College
Library
Fitchburg, Massachusetts 01420

Framingham State College
Henry Whittemore Library
Framingham, Massachusetts 01701

Lowell State College
Library
Rolfe Street
Lowell, Massachusetts 01854

Tufts University
Wessell Library
Medford, Massachusetts 02155

Education Development Center
55 Chapel Street
Newton, Massachusetts 02160

Pittsfield Regional Education Center
Project A.B.E. - LEAP
188 South Street
Pittsfield, Massachusetts 01201

Quincy Public Schools
Department of Library Services
100 Brooks Avenue
Quincy, Massachusetts 02169

Salem State College
Salem, Massachusetts 01970

Springfield College
Library
Alden Street
Springfield, Massachusetts 01109

Career Education Document Information System (CEDIS)
2 Sunlife Executive Park
100 Worcester Street
Wellesley Hills,
Massachusetts 02181

Westfield State College
Library
Westfield, Massachusetts 01085

Michigan

ERIC Clearinghouse on Counseling and Personnel Services
University of Michigan
School of Education, Room 2108
Ann Arbor, Michigan 48104

ERIC MICROFICHE COLLECTIONS

University of Michigan
General Library
Ann Arbor, Michigan 48104

Andrews University
James White Library
College Station
Berrin Springs, Michigan 49104

University of Michigan
Dearborn Campus Library
4901 Evergreen Road
Dearborn, Michigan 48128

Detroit Board of Education
Professional Library
1032 School Center Building
5057 Woodward Avenue
Detroit, Michigan 48202

Wayne State University
General Library - Education Division
Detroit, Michigan 48202

Michigan State University
Library - Serials Department
East Lansing, Michigan 48823

Genesee Community College
Charles Stewart Mott Library
1401 E. Court Street
Flint, Michigan 48503

Western Michigan University
Dwight B. Waldo Library
Kalamazoo, Michigan 49001

Michigan Department of Education
Library
735 E. Michigan Avenue
Lansing, Michigan 48933

Northern Michigan University
Marquette, Michigan 49855

Central Michigan University
Library - Documents Section
Mount Pleasant, Michigan 48858

Oakland Schools
Resource Center
2100 Pontiac Lake Road
Pontiac, Michigan 48054

Oakland University
Kresge Library
Rochester, Michigan 48063

Wayne County School District
Professional Resource Center
33030 Van Born Road
Wayne, Michigan 48184

Eastern Michigan University
Library
Ypsilanti, Michigan 48197

Minnesota

Bemidji State College
Clark Library
Bemidji, Minnesota 55601

Mankato State College
Memorial Library
Maywood & Ellis Street
Mankato, Minnesota 56001

University of Minnesota
Library - Serials Records Divison
Minneapolis, Minnesota 55455

Moorhead State College
Library - Serials Department
Moorhead, Minnesota 56560

St. Cloud State College
Library
St. Cloud, Minnesota 56301

College of St. Thomas
O'Shaughnessy Library
Summit and Cleveland
St. Paul, Minnesota 55105

Winona State College
Maxwell Library
Winona, Minnesota 55987

Mississippi

Delta State University
Library
Cleveland, Mississippi 38732

Mississippi State College for Women
J. C. Fant Library
Columbus, Mississippi 39701

University of Southern Mississippi
Library
Hattiesburg, Mississippi 39401

Jackson State University
1325 Lynch Street
Jackson, Mississippi 39217

Mississippi Department of Education
Educational Media Service
901 Sillers Building
Jackson, Mississippi 39205

Mississippi State University
Meridian Branch
5520 Highway 19 North
Meridian, Mississippi 39301

Mississippi State University
Mitchell Memorial Library
Mississippi State,
Mississippi 39762

University of Mississippi
Library
University, Mississippi 38677

Missouri

Southeast Missouri State College
Kent Library
Cape Girardeau, Missouri 63701

University of Missouri - Columbia
University Library
Columbia, Missouri 65201

Missouri State Department of Education
Jefferson Building
Jefferson City, Missouri 65101

Missouri Southern College
Library
Newman and Duquesne Road
Joplin, Missouri 64801

Kansas City Technical Education Center
1215 E. Truman Road
Kansas City, Missouri 64106

Mid-Continent Regional Education Laboratory
Resource Center
104 E. Independence Avenue
Kansas City, Missouri 64106

U.S. Office of Education /DHEW
Region VII
601 East 12th Street
Kansas City, Missouri 64106

University of Missouri
General Library
Kansas City, Missouri 64110

Northeast Missouri State University
Pickler Memorial Library
Kirksville, Missouri 63501

Southwest Missouri State University
Library
Springfield, Missouri 65802

St. Louis Board of Education
Library Services Center
1100 Farrar Street
St. Louis, Missouri 63107

University of Missouri - St. Louis
Library - Documents Section
8001 Natural Bridge Road
St. Louis, Missouri 63121

Washington University
Library
Audio-Visual Department
St. Louis, Missouri 63130

Central Missouri State College
Ward Edwards Library
Warrensburg, Missouri 64093

Montana

Eastern Montana College
Library
Billings, Montana 59101

Montana State University
Library
Bozeman, Montana 59715

Northern Montana College
Library
Havre, Montana 59501

Nebraska

Chadron State College
Reta King Library
Chadron, Nebraska 69227

Kearney State College
Library
Kearney, Nebraska 68847

University of Nebraska
Library
Lincoln, Nebraska 68508

University of Nebraska at Omaha
Gene Eppley Library
Omaha, Nebraska 68101

Wayne State College
Library
Wayne, Nebraska 68787

Nevada

University of Nevada - Las Vegas
Library
Las Vegas, Nevada 89109

University of Nevada - Reno
Library
Reno, Nevada 89507

New Hampshire

New Hampshire Department of Education
Statehouse Annex
Concord, New Hampshire 03301

University of New Hampshire
Library
Durham, New Hampshire 03824

Plymouth State College of the University of New Hampshire
Lamson Library
Plymouth, New Hampshire 03264

New Jersey

Educational Improvement Center
Northwest New Jersey
Halko Drive
Cedar Knolls, New Jersey 07927

New Jersey Residential Manpower Center
Occupational Research Center
Building 871
Camp Kilmer
Edison, New Jersey 08817

Glassboro State College
SEIMC
Savitz Library
Glassboro, New Jersey 08028

Jersey City State College
Forrest A. Irwin Library
Curriculum Materials Center
2039 Kennedy Boulevard
Jersey City, New Jersey 07305

Rutgers University
Alexander Library
New Brunswick, New Jersey 08901

Parsippany Troy Hills Board of Education
Parsippany, New Jersey 07054

Phillipsburg Free Public Library
Phillipsburg, New Jersey 08865

ERIC Clearinghouse on Tests, Measurement, and Evaluation
Educational Testing Service
Princeton, New Jersey 08540

Monmouth County Library
Eastern Branch
Area Reference Center
Route No. 35
Shrewsbury, New Jersey 07701

Seton Hall University
McLaughlin Library
South Orange, New Jersey 07079

Rider College
Library
2083 Lawrenceville Road
Trenton, New Jersey 08602

Trenton State College
Roscoe L. West Library
Pennington Road
Trenton, New Jersey 08625

Kean College of New Jersey
Library
Morris Ave
Union, New Jersey 07083

Montclair State College
Harry A. Sprague Library
Upper Montclair, New Jersey 07043

William Paterson State College
Library
300 Pompton Road
Wayne, New Jersey 07470

New Mexico

Southwestern Cooperative Educational Laboratory, Inc.
229A Truman, N. E.
Albuquerque, New Mexico 87108

University of New Mexico
Zimmerman Library - Serials Department
Albuquerque, New Mexico 87131

ERIC Clearinghouse on Rural Education and Small Schools
New Mexico State University
University Park Branch
Las Cruces, New Mexico 88003

New Mexico State University
Library
Las Cruces, New Mexico 88001

New Mexico Highlands University
Donnelly Library
Las Vegas, New Mexico 87701

New Mexico State Library
300 Don Gaspar
Sante Fe, New Mexico 87501

Western New Mexico University
Miller Library
Silver City, New Mexico 88061

New York

New York State Library
State Education Building
Albany, New York 12224

SUNY at Albany
1400 Washington Avenue
Albany, New York 12302

Board of Cooperative Educational Services
6 South Street
Belmont, New York 14813

SUNY College at Brockport
Library
Brockport, New York 14420

Fordham University
Library
Bronx, New York 10458

James Monroe High School
1300 Boynton Avenue
Bronx, New York 10472

Lehman College
Library
Bedford Park Boulevard West
Bronx, New York 10468

Manhattan College
Cardinal Hayes Library
Periodicals Department
Bronx, New York 10471

City University of New York
Brooklyn College Library
Serials Section
Brooklyn, New York 11210

SUNY at Buffalo
Lockwood Library
Buffalo, New York 14214

SUNY College at Buffalo
E. H. Butler Library
1300 Elmwood Avenue
Buffalo, New York 14222

Board of Cooperative Educational Services
Service Center
455 Cuyuga Road
Cheektowaga, New York 14225

SUNY College at Cortland
Teaching Materials Center
Education Building, D-206
Cortland, New York 13045

Board of Cooperative Educational Services
Library
431 Philo Road
Elmira, New York 14903

Queens College
Paul Klapper Library
Flushing, New York 11367

SUNY College at Fredonia
Library
Fredonia, New York 14063

Adelphi University
Library
Garden City, New York 11530

SUNY College at Geneseo
Milne Library
Geneseo, New York 14454

Long Island University
Library
Greenvale, New York 11548

Hofstra University
Library
Hempstead, New York 11550

Cornell University
Albert R. Mann Library
Ithaca, New York 14850

Queensborough Public Library
89-11 Merrick Boulevard
Jamaica, New York 11432

St. Johns University
Library
Grand Central & Utopia Parkways
Jamaica, New York 11432

La Guardia Community College
31-10 Thomson Avenue
Long Island City, New York 11101

ERIC MICROFICHE COLLECTIONS

Board of Cooperative Educational Services
Curriculum Resource Center
County Route 64
Mexico, New York 13114

Essex, Hamilton, Warren & Washington County Areas
Educational Center
Mineville, New York 12956

SUNY College at New Paltz
Library
New Paltz, New York 12561

College of New Rochelle
Library
New Rochelle, New York 10801

Bank Street College of Education
Library
610 West 112th Street
New York, New York 10025

Baruch College
Library - Serials Division
156 E. 25th Street
New York, New York 10010

City University of New York
City College Library
Serials Division
Convent Avenue at W. 135th Street
New York, New York 10031

City University of New York
Graduate Studies Division Library
33 W. 42nd Street
New York, New York 10036

Columbia University
Teachers College Library
525 W. 120th Street
New York, New York 10027

ERIC Clearinghouse on Urban Education
Teachers College
Columbia University
525 West 120th Street
New York, New York 10027

Hunter College
Library
695 Park Avenue
New York, New York 10021

New York Public Library
8 E. 40th Street
New York, New York 10016

New York University
Microform Center
70 Washington Square South
New York, New York 10012

U.S. Office of Education/DHEW
Region II
Federal Building C-Room 1013
26 Federal Plaza
New York, New York 10007

John Coutts Library Services, Inc.
736 - 738 Cayuga Street
Lewiston, New York 14092

New York Institute of Technology
Library
Wheatley Road
Old Westbury, New York 11568

SUNY College at Old Westbury
Library
Old Westbury, New York 11568

SUNY College at Oneonta
James M. Milne Library
Oneonta, New York 13820

SUNY College at Oswego
Penfield Library
Oswego, New York 13126

Board of Cooperative Educational Services
Suffolk County Regional Center
201 Sunrise Highway
Patchogue, New York 11772

Board of Cooperative Educational Services
John W. Harrold Education Center
Plattsburgh, New York 12901

SUNY College at Plattsburgh
Plattsburgh, New York 12901

SUNY College at Potsdam
Frederic W. Crumb Memorial Library
Potsdam, New York 13676

University of Rochester
Library
Rochester, New York 14627

Richmond College
Library
130 Stuyvesant Place
Staten Island, New York 10301

Wagner College
Horrman Library
Staten Island, New York 10301

SUNY at Stony Brook
Library
Stony Brook, New York 11790

Rockland Community College
Library
145 College Road
Suffern, New York 10901

Syracuse City School District
910 Erie Boulevard, East
Syracuse, New York 13210

Syracuse University
Library
Carnegie Building, Room 210
Syracuse, New York 13210

Board of Cooperative Educational Services
Mohawk Region Planning Center
Spring Road
Verona, New York 13470

Nassau Board of Cooperative Educational Services
Educational Resource Center
Research Library
1196 Prospect Avenue
Westbury, New York 11590

Board of Cooperative Educational Services
Curriculum Research Center
Pinesbridge Road
Yorktown Heights, New York 10598

North Carolina

Appalachian State University
Library
Boone, North Carolina 28607

University of North Carolina
Library - Serials Section
Chapel Hill, North Carolina 27514

Charlotte-Mecklenburg Schools
Curriculum Resources Center
Charlotte, North Carolina 28201

University of North Carolina at Charlotte
UNCC Station
Charlotte, North Carolina 28223

Western Carolina University
Hunter Library
Cullowhee, North Carolina 28723

Elizabeth City State University
Library
Elizabeth City,
North Carolina 27909

Fayetteville State University
Chesnutt Library
Fayetteville, North Carolina 28301

University of North Carolina at Greensboro
Walter Clinton Jackson Library
Greensboro, North Carolina 27412

East Carolina University
Library
Greenville, North Carolina 27834

North Carolina State Department of Public Instruction
Research and Information Center
Education Building
Raleigh, North Carolina 27611

North Carolina State University
D.H. Hill Library
Raleigh, North Carolina 27607

North Dakota

University of North Dakota
Chester Fritz Library
ERIC Center
Grand Forks, North Dakota 58201

Ohio

University of Akron
Library
Akron, Ohio 44304

Ohio University
Library - Serials Department
Athens, Ohio 45701

Baldwin - Wallace College
Ritter Library
Berea, Ohio 44017

Bowling Green State University
Library - Serials Department
Bowling Green, Ohio 43403

University of Cincinnati
Main Campus Library
Serials Division
Cincinnati, Ohio 45221

ERIC MICROFICHE COLLECTIONS

Xavier University
Library
Victory Parkway & Dana Avenue
Cincinnati, Ohio 45207

Cleveland State University
Library - Serials
Cleveland, Ohio 44115

ERIC Clearinghouse for Science, Mathematics, and Environmental Education
Ohio State University
1800 Cannon Drive
Columbus, Ohio 43210

Ohio Education Association
Professional Development Division
225 East Broad Street
Columbus, Ohio 43215

Ohio State Department of Education
781 Northwest Boulevard
Columbus, Ohio 43212

Ohio State University
Library - Serials Division
1858 Neil Avenue
Columbus, Ohio 43210

Ohio State University
Research Library
Center for Vocational Education
1900 Kenny Road
Columbus, Ohio 43210

Wright State University
Library
Colonel Glenn Highway
Dayton, Ohio 45431

Kent State University
Library
Kent, Ohio 44242

Miami University
Library
Oxford, Ohio 45056

University of Toledo
Library
Toledo, Ohio 43606

Central State University
Hallie Q. Brown Library
Wilberforce, Ohio 45384

Youngstown State University
Library
410 Wick Avenue
Youngstown, Ohio 44503

Oklahoma

East Central State College
Library
Ada, Oklahoma 74820

Central State University
Library - ERIC Office
Edmond, Oklahoma 73034

University of Oklahoma
Library
401 W. Brooks, Room 130
Norman, Oklahoma 73069

Oklahoma State Regents for Higher Education
State Capitol Station
Oklahoma City, Oklahoma 73105

Oklahoma State University
Library - Serials Section
Stillwater, Oklahoma 74074

Northeastern Oklahoma State University
Library
Tahlequah, Oklahoma 74464

University of Tulsa
McFarlin Library
Tulsa, Oklahoma 74104

Southwestern State College
Library
Weatherford, Oklahoma 73096

Oregon

Southern Oregon College
Library
1250 Siskiyou Boulevard
Ashland, Oregon 97520

Oregon State University
William Jasper Kerr Library
Corvallis, Oregon 97331

ERIC Clearinghouse on Educational Management
University of Oregon
Library - South Wing
Eugene, Oregon 97403

Northwest Regional Educational Laboratory
400 Lindsay Building
710 S.W. Second Avenue
Portland, Oregon 97204

Portland State University
Library
Portland, Oregon 97207

Oregon Department of Education
Resources Dissemination Center Library
942 Lancaster Drive N.E.
Salem, Oregon 97310

Pennsylvania

Bloomsburg State College
College Library
Bloomsburg, Pennsylvania 17815

California State College
California, Pennsylvania 15419

Cheyney State College
L. P. Hill Library
Cheyney, Pennsylvania 19319

Clarion State College
Library
Clarion, Pennsylvania 16214

East Stroudsburg State College
Kemp Library
East Stroudsburg,
Pennsylvania 18301

Edinboro State College
Hamilton Library
Edinboro, Pennsylvania 16412

Pennsylvania State Library
Bureau of Technical Services
Education Building, Room 46
Harrisburg, Pennsylvania 17126

Indiana University of Pennsylvania
Library
Indiana, Pennsylvania 15701

Regional Resources Center of Eastern Pennsylvania for Special Education
443 S. Gulph Road
King of Prussia,
Pennsylvania 19406

Research and Information Services for Education (RISE)
198 Allendale Road
King of Prussia,
Pennsylvania 19406

Kutztown State College
Library
Kutztown, Pennsylvania 19530

Lock Haven State College
Stevenson Library
Lock Haven, Pennsylvania 17745

Mansfield State College
Library
Mansfield, Pennsylvania 16933

Pennsylvania State University
Library
Capitol Campus
Middletown, Pennsylvania 17057

Millersville State College
Ganser Library
Millersville, Pennsylvania 17551

Bucks County Community College
Library - Swamp Road
Newtown, Pennsylvania 18940

Research for Better Schools, Inc.
Library
1700 Market Street
Philadelphia, Pennsylvania 19103

Saint Joseph's College
Library
City Avenue at 54th Street
Philadelphia, Pennsylvania 19131

School District of Philadelphia
Pedagogical Library
21st Street South of the Parkway
Philadelphia, Pennsylvania 19103

Temple University
Library - Serials Section
Philadelphia, Pennsylvania 19122

U.S. Office of Education/DHEW
Region III
401 N. Broad Street
Philadelphia, Pennsylvania 19108

University of Pittsburgh
Hillman Library
Pittsburgh, Pennsylvania 15260

Shippensburg State College
Library
Shippensburg, Pennsylvania 17257

Slippery Rock State College
Maltby Library
Slippery Rock, Pennsylvania 16057

Pennsylvania State University
Pattee Library
University Park,
Pennsylvania 16802

West Chester State College
Francis Harvey Green Library
West Chester, Pennsylvania 19380

King's College
D. Leonard Corgan Library
Wilkes-barre, Pennsylvania 18711

Wilkes College
Eugene Shedden Farley Library
Franklin at South Street
Wilkes-barre, Pennsylvania 18703

Rhode Island

University of Rhode Island
Library
Kingston, Rhode Island 02881

Rhode Island College
James P. Adams Library
600 Mt. Pleasant Avenue
Providence, Rhode Island 02908

South Carolina

Charleston County School District
Media Center
3 Chisolm Street
Charleston, South Carolina 29401

Citadel Military College
Library
Charleston, South Carolina 29409

Clemson University
Library
Clemson, South Carolina 29631

South Carolina State Library
1500 Senate Drive
Columbia, South Carolina 29201

Darlington County School District
Information and Publication Center
255 Blue Street
Darlington, South Carolina 29532

South Carolina State College
Miller F. Whittaker Library
Orangeburg, South Carolina 29115

Winthrop College
Dacus Library
Rockhill, South Carolina 29730

South Dakota

South Dakota State Library
322 South Fort Street
Pierre, South Dakota 57501

University of South Dakota
I. D. Weeks Library
Vermillion, South Dakota 57069

Tennessee

Austin Peay State University
Woodward Library
Clarksville, Tennessee 37040

Tennessee Technological University
Jere Whitson Memorial Library
Cookeville, Tennessee 38501

East Tennessee State University
Library
Johnson City, Tennessee 37601

University of Tennessee at Knoxville
Research Coordinating Unit
909 Mountcastle Street
Knoxville, Tennessee 37916

Memphis State University
John Brister Library
Memphis, Tennessee 38111

Middle Tennessee State University
Library
Murfreesboro, Tennessee 37130

Joint University Libraries
Nashville, Tennessee 37203

University of Tennessee at Nashville
Library
323 McLemore Avenue
Nashville, Tennessee 37203

Texas

Abilene Christian College
Library
Abilene, Texas 79501

Juarez-Lincoln Center
Library
3001 S. Congress
Austin, Texas 78704

Southwest Educational Development Laboratory
211 East Seventh Street
Austin, Texas 78701

Texas Education Agency
Resource Center, Library
201 East 11th Street
Austin, Texas 78701

Texas Information Service
Education Service Center
Region XIII
6504 Tracor Lane
Austin, Texas 78721

University of Texas at Austin
Library
Austin, Texas 78712

Lamar University
Library
Beaumont, Texas 77710

West Texas State University
Library
Canyon, Texas 79016

Texas A & M University
Library
College Station, Texas 77843

East Texas State University
Library
Commerce, Texas 75428

Texas A & I University at Corpus Christi
Library
Corpus Christi, Texas 78411

Crystal City Independent School District
805 East Crockett
Crystal City, Texas 78839

Dallas Baptist College
3000 Florina Road
Library
Learning Center
Dallas, Texas 75211

Dallas Public Library
1954 Commerce Street
Dallas, Texas 75202

North Texas State University
Library
Denton, Texas 76203

Texas Woman's University
Library
Denton, Texas 76204

Pan American University
Library
Edinburg, Texas 78539

Education Service Center
Region XIX
6611 Boeing Street
El Paso, Texas 79925

University of Texas at El Paso
Library-Reference Office
El Paso, Texas 79968

Houston Baptist University
Houston, Texas 77036

Texas Southern University
University Library
3201 Wheeler Avenue
Houston, Texas 77004

University of Houston
Library
2700 Bay Area Boulevard
Houston, Texas 77058

University of Houston
Library
Cullen Boulevard
Houston, Texas 77004

Sam Houston State University
Library
Huntsville, Texas 77340

University of Dallas
Library
University of Dallas Station
Irving, Texas 75060

Central Texas College
Highway 190 West
Killeen, Texas 76541

Texas A & I University at Kingsville
Library
Kingsville, Texas 78363

Texas A & I University at Laredo
Library
Laredo, Texas 78040

Education Service Center
Region XVII
713 Citizens Tower
Lubbock, Texas 79401

Texas Technological University
Library
Lubbock, Texas 70409

Education Service Center
Region VIII
100 North Riddle Street
Mount Pleasant, Texas 75455

Stephen F. Austin State University
Library
Nacogdoches, Texas 75961

ERIC MICROFICHE COLLECTIONS

Ector County Independent School District
Curriculum Library
Odessa, Texas 79760

University of Houston at Clear Lake City
Library
945 E. Shaw
Pasadena, Texas 77502

Education Service Center
Region X
Richardson, Texas 75080

University of Texas at Dallas
Library
Richardson, Texas 75080

Angelo State University
Library
San Angelo, Texas 76901

Our Lady of the Lake College
Library
San Antonio, Texas 78285

Trinity University
Chapman Graduate Center Library
715 Stadium Drive
San Antonio, Texas 78284

University of Texas at San Antonio
4242 Piedras East
San Antonio, Texas 78225

Southwest Texas State University
Library
San Marcos, Texas 78666

Texarkana College
Palmer Memorial Library
Texarkana, Texas 75501

Texas College
Library
Tyler, Texas 75701

Baylor University
1919 South First Street
Waco, Texas 76706

Education Service Center
Region IX
3014 Old Seymour Road
Wichita Falls, Texas 76309

Utah

Utah State University
Merrill Library
Logan, Utah 84321

Weber State College
Library
Ogden, Utah 84403

Brigham Young University
Library
Provo, Utah 84602

University of Utah
Library
Salt Lake City, Utah 84112

Utah State Board of Education
Technical Assistance Reference Center
1400 University Club Building
136 East South Temple Street
Salt Lake City, Utah 84111

Vermont

Twin State Educational Information System
Vermont State Department of Education
Montpelier, Vermont 05602

Virginia

Alexandria City Schools
Nichols Memorial Professional Library
3330 King Street
Alexandria, Virginia 22313

Arlington County Public Schools
Professional Library
1426 N. Quincy Street
Arlington, Virginia 22207

ERIC Clearinghouse on Languages and Linguistics
Center for Applied Linguistics
1611 North Kent Street
Arlington, Virginia 22209

Virginia Polytechnic Institute and State University
Library
Blacksburg, Virginia 24061

University of Virginia
Alderman Library
Charlottesville, Virginia 22901

Fairfax County Public Schools
Professional Reference Library
3500 Old Lee Highway
Fairfax, Virginia 22030

George Mason University
Library
Fairfax, Virginia 22030

ERIC Clearinghouse on Reading and Communication Skills
Speech Communication Module
5205 Leesburg Pike
Falls Church, Virginia 22041

Madison College
Madison Memorial Library
Harrisonburg, Virginia 22801

Old Dominion University
Hughes Library
Norfolk, Virginia 23508

Virginia State College
Johnston Memorial Library
Petersburg, Virginia 23803

ERIC Clearinghouse on Handicapped and Gifted Children
1920 Association Drive
Reston, Virginia 22091

Virginia Polytechnic Institute and State University
Reston Reserve Library
12100 Sunset Hills Road
Reston, Virginia 22090

Virginia Commonwealth University
James Branch Cabell Library
901 Park Avenue
Richmond, Virginia 23220

Virginia State Board of Education
1312 E. Grace Street
Room 224
Richmond, Virginia 23216

College of William and Mary
Earl Gregg Swen Library
Williamsburg, Virginia 23185

Washington

Bellevue School District No. 405
310 - 102nd Avenue, N. E.
Bellevue, Washington 98004

Western Washington State College
Wilson Library
Bellingham, Washington 98225

Eastern Washington State College
Library
Cheney, Washington 99004

Central Washington State College
Victor J. Bouillon Library
Ellensburg, Washington 98926

Superintendent of Public Instruction
Library
Old Capitol Building
Olympia, Washington 98504

Intermediate School District No. 123
Road 40 and Court Street
Pasco, Washington 99302

Washington State University
Library
Pullman, Washington 99163

Seattle Education Service District No. 110
110 Crockett Street
Seattle, Washington 98109

Seattle Pacific College
Weter Memorial Library
3307 3rd W.
Seattle, Washington 98119

Seattle School District No. 1
Planning Research and Evaluation Unit
815 Fourth Avenue N.
Seattle, Washington 98109

University of Washington
Library
Seattle, Washington 98195

West Virginia

Bluefield State College
Library
Bluefield, West Virginia 24701

Appalachia Educational Laboratory, Inc.
Research and Evaluation Division
Charleston, West Virginia 25325

West Virginia State Department of Education
State Office Building No. 6
Charleston, West Virginia 25305

Glenville State College
Robert F. Kidd Library
Glenville, West Virginia 26351

Marshall University
Huntington, West Virginia 25701

West Virginia College of Graduate Studies
Hill Hall
Institute, West Virginia 25112

West Virginia Institute of Technology
Library
Montgomery, West Virginia 25136

West Virginia University
Human Resources & Education
Special Education Department
805 Allen Hall
Morgantown, West Virginia 26506

West Virginia University
Library
Morgantown, West Virginia 26506

Wisconsin

Wisconsin State University - Eau Claire
William D. McIntyre Library
Eau Claire, Wisconsin 54701

University of Wisconsin - Parkside
Library
Wood Road
Kenosha, Wisconsin 53140

University of Wisconsin - La Crosse
Murphy Library
1631 Pine Street
La Crosse, Wisconsin 54601

Madison Public Schools
Educational Reference Library
545 West Dayton Street
Madison, Wisconsin 53703

University of Wisconsin - Madison
1000 Bascom Mall
154 Education Building
Madison, Wisconsin 53706

Wisconsin Board of Vocational Technical and Adult Education
4802 Sheboygan Avenue
Madison, Wisconsin 53702

Wisconsin Department of Public Instruction
Professional Library
126 Langdon Street
Madison, Wisconsin 53714

University of Wisconsin - Stout
Robert L. Pierce Library
Menomonie, Wisconsin 54751

Alverno College
Library - Serials
3401 South 39th Street
Milwaukee, Wisconsin 53215

University of Wisconsin - Milwaukee
Library
2500 E. Kenwood Boulevard
Milwaukee, Wisconsin 53211

University of Wisconsin - Oshkosh
Forrest R. Polk Library
Oshkosh, Wisconsin 54901

Waukesha County Technical Institute
800 Main Street
Pewaukee, Wisconsin 53072

University of Wisconsin - Platteville
Library - Serials
725 West Main Street
Platteville, Wisconsin 53818

University of Wisconsin - River Falls
Chalmer Davie Library
River Falls, Wisconsin 54022

University of Wisconsin - Superior
Hill Library
Superior, Wisconsin 54880

University of Wisconsin - White Water
Library
White Water, Wisconsin 53190

Wyoming

Wyoming State Department of Education
State Office Building - West
Cheyenne, Wyoming 82002

University of Wyoming
Library
Laramie, Wyoming 82070

FOREIGN

Australia

University of Queensland
Main Library
St. Lucia
Brisbane, Australia

Mount Gravatt Teachers College
Library
Mount Gravatt Q. 4122, Australia

University of New England
Library
Armidale
New South Wales 2351, Australia

National Library of Australia
Canberra, Act 2600
Australia

Macquarie University
Library
North Ryde
New South Wales 2113
Australia

Monash University
Library
Clayton, Victoria 3168
Australia

Western Australian Institute of Technology
Library
Hayman Road
Bentley, West Australia 6102
Australia

Canada

Calgary Board of Education
Education Media Selection Center
307 55th Avenue S.W.
Calgary, Alberta T2H 0A1
Canada

University of Calgary
Library - Government Publications
2920 24th Avenue, N.W.
Calgary, Alberta T2N 1N4
Canada

University of Alberta
Library
Edmonton, Alberta T6G 2E1
Canada

University of Lethbridge
Library
Lethbridge, Alberta T1K 3M4
Canada

University of British Columbia
Library - Government Publications
Vancouver,
British Columbia V6T 1W5
Canada

University of Victoria
McPherson Library
Victoria, British Columbia
Canada

Brandon University
John E. Robbins Library
Brandon, Manitoba R7A 6A9
Canada

ERIC MICROFICHE COLLECTIONS

Department of Youth and Education
Library
1181 Portage Avenue, Room 206
Winnipeg, Manitoba R3T 2N2
Canada

University of Manitoba
Elizabeth Dafoe Library
Periodical Department
Winnipeg, Manitoba R3E O2W
Canada

Universite de Moncton
Bibliotheque Champlain
Moncton, New Brunswick
Canada

Mount Allison University
Bell Library
Sackville, New Brunswick
Canada

Memorial University of Newfoundland
Education Library
St. John's, Newfoundland
Canada

Nova Scotia Teachers College
Library
Truro, Nova Scotia
Canada

University of Guelph
Library
Guelph, Ontario N1G 2W1
Canada

Queen's University
Library
Faculty of Education
Duncan McArthur Hall
Kingston, Ontario K7l 3N6
Canada

University of Western Ontario
General Library
Lawson Memorial Building
London, Ontario N6A 3K7
Canada

National Library of Canada
395 Wellington Street
Ottawa, Ontario K1A 0N4
Canada

University of Ottawa
Central Library
Ottawa, Ontario K1N 6N5
Canada

Brock University
Library Document Section
Decew Campus
St. Catherines, Ontario L2S 3A1
Canada

Board of Education - Toronto
Education Centre
Library
155 College Street
Toronto, Ontario M5T 1H6
Canada

Ontario Institute for Studies in Education
Library
252 Bloor Street, West
Toronto, Ontario M5R lV5
Canada

Toronto Metropolitan Separate School Board
Professional Library
146 Laird Drive
Toronto, Ontario M4G 3V8
Canada

Borough of North York
F.W. Minkler Library
Educational Administration Centre
5050 Yonge Street
Willowdale, Ontario M2N 5N8
Canada

University de Quebec
Library
Chicoudimi
Quebec
Canada

Concordia University
Library
1445 de Maisonneuve Boulevard
Montreal, Quebec H3G 1M8
Canada

McGill University
Library
3459 McTavish Street
Montreal 101, Quebec
Canada

Ministere de l'Education
Centre de Documentation
Service des Moyens Techniques d'Enseignement
655 Rue Parthenais
Montreal, Quebec H2K 3R7 Canada

Sir George Williams University
Library
Montreal 25, Quebec
Canada

Universite de Montreal
Bibliotheque
Faculte des Sciences De L'Education
Montreal 101, Quebec H3A 1Y1
Canada

Universite de Quebec a Montreal
Bibliotheques
Case Postale 8889
Montreal, Quebec H3C 3P8
Canada

Ministere des Communications
Service des Periodiques
Edifice G - Rez de Chaussee
675 Street, Cyrille Est
Quebec, Quebec
Canada

Universite de Quebec
Services Universitaires dans le Nord-Quest
C. P. 700 Rouyn
Quebec, Quebec J9X 5C6
Canada

Universite Laval
Bibliotheque Generale
Quebec 10, Quebec
Canada

Universite de Sherbrooke
Bibliotheque
Sherbrooke, Quebec
Canada

Department of Manpower and Immigration
Training Research and Development
8th Street East
Prince Albert,
Saskatchewan S6V 5T2 Canada

University of Regina
Library
Regina, Saskatchewan S4S 0A2
Canada

University of Saskatchewan
Library
Regina Campus
Regina, Saskatchewan S7N 0W0
Canada

University of Saskatchewan
Library
Saskatoon, Saskatchewan S7N 0W0
Canada

Denmark

Denmark Educational Library
Leroso Parkalle 101
DK 2100
Copenhagen O
Denmark

England

National Lending Library For Science and Technology
Boston Spa, Yorkshire
England

Germany

August Raader-Fuchhandlung Universitysliteratur
Taschenbuchladen
44 Munster/Wetf
Drubbel 19, Post Fach 1309
(0251)44571 Ferhur, Germany

U.S. Dependent Schools
European Area
Superintendents Office
Karlsruhe
Germany

Padagogisches Zentrum Bibliothek
Berliner Str. 40/41
1 Berlin 31
Germany

Guam

University of Guam
Robert F. Kennedy Library
Agana, Guam 96910
Guam

Japan

U. S. Asiatic Co., Ltd.
Tsutsumi Building
13-12 Shimbashi 1-Chome
Minato Ku, Tokyo
Japan

Mexico

Ciudad Universitaria
Direccion General de Bibliotecas
Biblioteca Central-Entrepiso
Mexico 20, D. F. Mexico

Servicio Nacional (ARMO)
Centro de Informacion Tecnica Y Documentacion
Calz. Atzcapotzalco La Villa 209
Mexico 16, D.f.
Mexico

Netherlands

Bernard Van Leer Foundation
Koninginnegracht 52
The Hague
Netherlands

Norway

Universitetbiblioteket 1 Oslo
Royal University Library
Drammensveien 42
Oslo 2
Norway

Puerto Rico

Inter American University of Puerto Rico
Library - San Juan Campus
405 Ponce de Leon Avenue
Apartado 1293
Hato Rey, 00919 Puerto Rico

Puerto Rico Department of Education
Research Coordinating Units
Tres Monjitas
Hato Rey, 00931
Puerto Rico

Catholic University of Puerto Rico
Encarnacion Valdes Library
Ponce, 00731
Puerto Rico

University of Puerto Rico
Biblioteca General
Rio Piedras, 00931
Puerto Rico

Saudi Arabia

Ministry of Education
Educational Data Unit
Riyadh, Saudi Arabia

Sweden

Statens Psykologisk Pedagogiska
Bibliotek
Stockholm 23
Sweden

Switzerland

UNESCO
International Bureau of Education
Palais Wilson
1211 Geneve 14
Switzerland

Virgin Islands

College of the Virgin Islands
St. Croix Campus Library
St. Croix, 00850
Virgin Islands

College of the Virgin Islands
Library
St. Thomas, 00801
Virgin Islands